Monster bandwidth

Special-effects company Industrial Light & Magic muscles up with 10G. Get details in our exclusive 10G Ethernet editorial supplement. Coverage begins after page 26.

NetworkWorld

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August 18, 2003 ■ Volume 20, Number 33

Review

SOFTWARE-BASED WEB APPLICATION FIREWALLS

AppShield edges InterDo in battle of software that filters Port 80 traffic. **Page 48.**

RBOCs & cable wage turf war

■ BY JIM DUFFY

Battle of the Bundle

Time was you would buy TV service from your cable company, telephone service from your phone company, and that was that.

But now cable companies are offering phone services at hard-to-pass-up prices, while phone companies are fighting back with plans for TV services delivered through brand-new agreements with leading satellite TV providers.

The heated competition between regional Bell operating companies and cable companies shows no signs of abating as the rivals invade each others' turf with "triple play" — voice, data and video — service bundles designed to attract new customers and retain old ones. Throw wireless services into the mix and the prospects for even fiercer battles — and even more aggressively priced service packages — loom.

"A driving factor in our success continues to be our bundling strategy," said Cox Communications President and CEO Jim Robbins during the company's earnings announcement last month. "Today nearly one-third of our customers buy multiple services."

The chief business beneficiaries of this budding competition are home office workers and very small companies, customers the RBOCs covet as much as the millions of residential users.

"We take [cable competitors] very seriously," says Mark Pitchford, senior vice president of consumer marketing at Qwest. The carrier does not divulge numbers, but has seen line loss to cable operators in some of its larger metropolitan markets.

Such encroachment by cable operators in RBOC territory is just beginning and is likely to last a long time, analysts say.

"Cable competition is the greatest threat to Bell franchises," says John Hodulik, an analyst at UBS Warburg, who says he believes

See RBOCs, page 10

HP prepping all-in-one server mgmt. software

■ BY JENNIFER MEARS AND DENI CONNOR

HP is readying server management software that should give users control of Unix, Linux and Windows machines from a single console, a capability analysts say will be particularly important as businesses consolidate workloads to boost efficiencies in their data centers.

The software, code-named Nimbus, will be the first integrated tool from a systems vendor that handles the nitty-gritty of server management regardless of platform, from updating server BIOS and driver agents to

See Nimbus, page 12

Latest worm puts focus on patch woes

■ BY ELLEN MESSMER AND JOHN FONTANA

The Blaster worm that last week infiltrated hundreds of thousands, if not millions, of Windows-based computers once again highlighted the IT community's inability to plug software holes even when they have been detected and patches have been issued.

As *Network World* went to press late Friday, Microsoft was preparing for what was supposed to be a denial-of-service

See Blaster, page 13

In-Site Lessons from leading users **North Bronx Healthcare Network**

Bronx hospital leaps to 10G

■ BY PHIL HOCHMUTH

The good news was that the LAN at the North Bronx Healthcare Network was predictable; unfortunately that was the bad news, too.

With zero network downtime in five years, the Cisco-based LAN was "a phenomenally stable environment," says Dan Morreale, CIO at NBHN. But doctors and nurses using the system also could count on phenomenal delays when using applications over the healthcare provider's 10M bit/sec hubs and Fast Ethernet backbone. In fact, when running network applications, some NBHN staff members were known for giving computer screens that old familiar cheer for which this New York borough is famous.

"Clinicians were waiting 4 or 5 seconds or more for a response from the network. That wasn't going to fly."

Dan Morreale
CIO, North Bronx Healthcare Network

"Clinicians were waiting 4 or 5 seconds or more for a response from the network" when using certain applications, Morreale says. "That wasn't going to go fly."

A standard prescription for such a network problem might call for a Gigabit Ethernet upgrade. Instead, NBHN is skipping a step in the traditional migration

See Bronx, page 11

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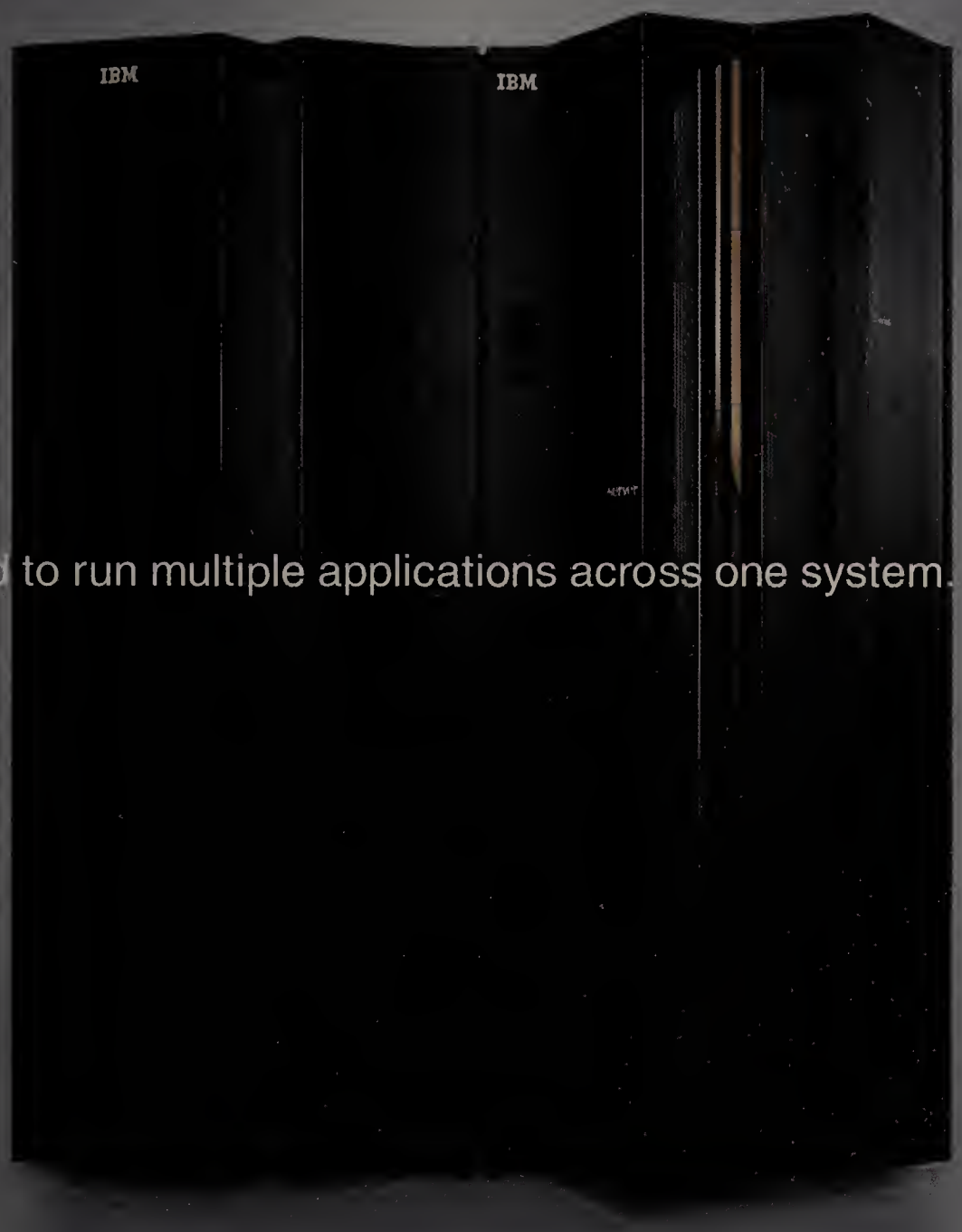

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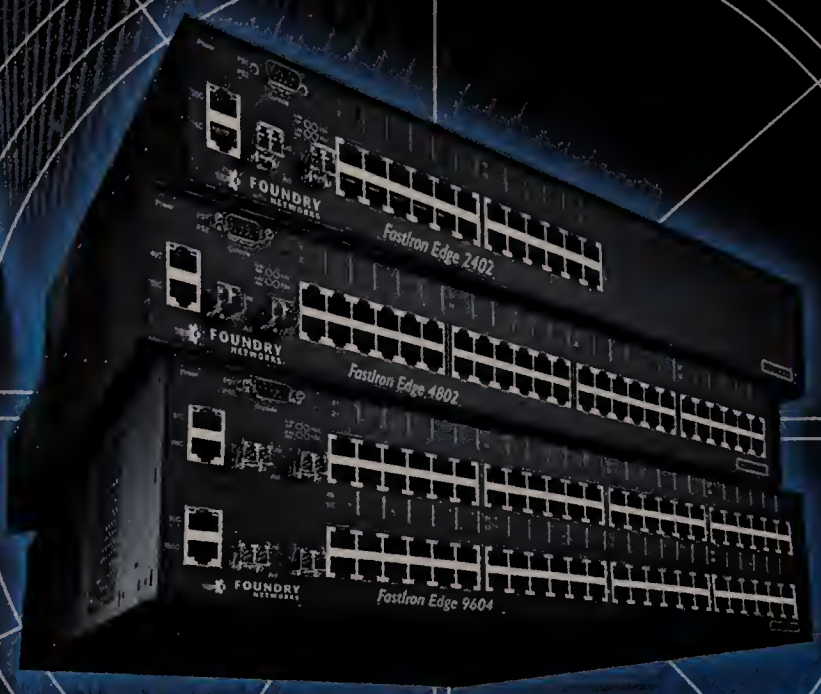

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8/18/03

NetworkWorld

News

■ **8** As **patent suits** proliferate, so do worries.

■ **12 Chip vendor** claims wireless breakthrough.

■ **18 Money** remains tight for IT start-ups.

■ **18 Sonic Mobility** extends Exchange administration to handhelds.

Infrastructure

■ **19** Lifeline: Backup as a way of life.

■ **19** HP eases management of storage tape libraries.

■ **20 Kevin Tolly:** Ethernet NICs: Are they really a commodity?

Enterprise Applications

■ **21** Simplicity key to videoconferencing success.

■ **21** Keynote offers Web site mgmt. service.

■ **22 Scott Bradner:** Is the allure of copper fading?

Service Providers

■ **23** Nextel to offer private Wi-Fi network service.

■ **23** Savvis teams with AccessLine on voice mgmt. services.

■ **25 Johna Till Johnson:** SSL — the next-generation VPN.

Net.Worker

■ **43** Procom server appliance ups the ante.

Technology Update

■ **44** API eases network processing integration.

■ **44 Steve Blass:** Ask Dr. Internet.

■ **45 Mark Gibbs:** Storage appliances and the latest on RAID.

■ **45 Keith Shaw:** Cool tools, gizmos and other neat stuff.

Opinions

■ **46 Editorial:** 10G: Worth your attention.

■ **47 Jeff Kaplan:** ASPs prepare to make comeback.

■ **47 Thomas Nolle:** Time to end the MCI saga.

■ **66 BackSpin:** Readers have their say about MCI and ethics.

■ **66 'Net Buzz:** Dear Mr. President . . .

Management Strategies

■ **49** Interviewing acumen: Establishing job competencies and using behavioral event interviewing can lead you to the perfect hire.

■ **61** Career classifieds.

Features

Review:

AppShield from Sanctum wins our test of six software-based Web application firewalls. **Page 48.**

WLAN traffic analyzers:

If you're looking for an effective wireless LAN traffic analyzer, the combination of AiroPeek NX and RFGrabber from Wild Packets does the trick. **Page 51.**

10G

Big Bad Bandwidth

Our special editorial supplement, beginning after **Page 26.**

- The latest on **10G switches.** **Page S5.**
- Special effects experts at **Industrial Light & Magic** flex some 10G muscle. **Page S10.**
- 10G from the enterprise, into the MAN and **across the WAN.** **Page S13.**

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Weblogs

Cool Tools

Motion Computing adds keyboard to tablet

Senior Reviews Editor Keith Shaw alerts you to Motion's latest announcement — the full-sized Hardtop Keyboard, which lets a user take his tablet and make it look and feel more like a notebook/desktop computer.

DocFinder: 7236

Forum

The end of NetWare

Would Novell be making the best — or worst — move by phasing out the classic NOS? Add your thoughts.

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Seminars and events

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The new data center is the driving force of the enterprise, taking command and control through consolidation and virtualization, automation and efficiency. If your data center isn't fully metered, fully accountable and fully effective, don't miss this Network World Technology Tour event, which is free to qualified professionals.

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Columnists

Compendium

Spam calculator

Fusion Executive Editor Adam Gaffin tells you about our new spam calculator, which lets you plug in various assumptions (for example, your average employee salary and estimated percent of mail that is spam) to find out how much spam is costing your company.

DocFinder: 7238

Wireless Wizards

Choosing between antennae and beam steering

The Wizards explain the difference and which is best for your wireless LAN environment.

DocFinder: 7239

Telework Beat

Good times for virtual call centers

Net.Worker Managing Editor Toni Kistner says brick-and-mortar call centers soon might be a thing of the past.

DocFinder: 7240

Small Business Tech

Is it really so much to ask?

Columnist James Gaskin outlines what he thinks small businesses need from an-all-in-one server.

DocFinder: 7241

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News Bits

Verizon joins 'push-to-talk' game

■ Verizon Wireless this week was expected to turn up a nationwide "push-to-talk" service, thus becoming the second mobile operator to offer the walkie-talkie-type service. Until now, Nextel has differentiated itself with its push-to-talk service, which observers have credited for the wireless operator's industry-low customer churn rate. Analysts expect Sprint PCS to launch a similar service later this year. Push-to-talk lets customers connect directly with other push-to-talk users on the same network by pressing a button on their handset. Business customers can set up and manage group calling lists on Verizon Wireless' Contact Management Web site without going through customer service or a Verizon Wireless retail store, the carrier says. The monthly access fees for the service range from $60 to $220.

MCI hires AT&T veteran for top spot

■ After weeks of being on the defensive and responding to a series of allegations of wrongdoing by chief competitor AT&T, MCI last week announced the appointment of a former senior AT&T executive as its new president. MCI named Richard Roscitt to serve as its president and COO, who will report to Chairman and CEO Michael Capellas. Roscitt brings more than 30 years of telecom experience to the company, having served most recently as chairman and CEO of ADC Telecommunications, and he is currently a member of the board of directors of the Telecommunications Industry Association. Before ADC, he was president of AT&T Business Services and president and CEO of AT&T Solutions. Roscitt will oversee MCI's core operating units and will be based in the company's headquarters in Ashburn, Va. Capellas said the company wasn't out seeking a COO. "This was a question of the right guy for the job," he said. "There was no other candidate considered." Roscitt will begin work Sept. 1.

SCO touts licensing revenue

■ The SCO Group predicted last week that it would book close to $12 million in revenue on Unix licensing deals with technology companies next quarter. The company said the revenue would come from its SCOsource licensing initiative, which was created in January to manage licensing fees for the System V Unix source code that SCO owns. SCO is in Unix license negotiations with a number of companies, according to a company spokesman. The revenue in question is expected to come from technology companies looking to secure the Unix rights, and not from Linux users signing up for its Intellectual Property License for Linux program. Last week SCO branched beyond licensing Unix to technology vendors when it created a new SCOsource product, aimed at Linux users, called SCO Intellectual Property License for Linux. SCO says the Linux source code violates its intellectual property rights and has offered its Linux license, at a cost of $699 per processor for server users.

COMPENDIUM

Those wacky porn sites

Unix Girl says porn sites have found a new way to increase their Google rankings: They link to images on unsuspecting Weblogs. Every time somebody goes to the porn site, the images get called and another link is added to the Weblogs public referrer log — then gets indexed by Google.

You'll get plenty of stuff you have to see every day, even Monday, in Compendium. www.nwfusion.com, DocFinder: 7254.

TheGoodTheBadTheUgly

Mobile phones to the rescue. Firefighters in the Scottish county of Fife are testing a photo-messaging technology that could help save lives, according to a BBC report. The firefighters are being outfitted with mobile phones that let them transmit pictures of victims' injuries to doctors before patients arrive at hospitals, enabling medical teams to better prepare. ➤

Sins of the father. How do you know the parent company is in trouble? When the kids want nothing to do with their last name. Such is the case with AOL and scandal-plagued Time Warner, as the former has asked the latter to set it free from the AOL Time Warner moniker, as was widely reported last week.

Squeezed out. Start-up Aspelle, a member of the crowded Secure Sockets Layer remote-access market, is closing shop this week after failing to get a second round of funding. The company, which as recently as July touted itself in a press release as "the SSL VPN software leader," had hoped to sell its Aspelle Everywhere products to large corporations with the promise that the software would work essentially as an add-on to Microsoft products.

Los Alamos getting Linux supercomputer

■ Another Linux supercomputer cluster with Advanced Micro Devices' Opteron chip is in the works, this time for Los Alamos National Laboratory's nuclear weapons testing program. Linux Networx last week announced it has been selected to build the cluster of 1,408 dual-processor Opteron servers. The system, known as Lightning, will deliver theoretical peak performance of 11.26 trillion floating-point operations per second (FLOPS), the company said. The deal is worth $10 million, and Linux Networx expects to complete the system in September, Dean Hutchings, COO of the company, says. A number of Linux supercomputers have been announced over the past few weeks. Dell is working on what will become the fastest Linux supercomputer when it is finished later this year, with 17.7 trillion FLOPS of peak theoretical performance. IBM and Fujitsu also are developing Linux supercomputers that will be deployed next year with TFLOPS results expected to be similar to that of the Linux Networx system.

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As patent suits proliferate, so do worries

■ BY JOHN COX

You're wondering whether to tell the boss that his BlackBerry e-mail handheld could become an expensive paperweight because of a patent suit against Research in Motion by NTP.

Your legal team is poring through software license contracts with your Linux vendor trying to find out if you should stick with that arrangement — and face a patent lawsuit from The SCO Group — or take the new licensing deal that SCO is offering.

You see that Microsoft has been ordered to pay a $521 million infringement award for adding code that lets Internet Explorer run applets and plug-ins, and that eBay must pony up $30 million because the "Buy it Now" feature on its Web site infringed on patents. Your mind turns to the software-based business methods you're exposing on your own Web site through those nifty new Web services, and about how these services are interacting with services on someone else's Web site.

Suddenly the terms "patent protection" and "patent infringement" take on a whole new meaning.

Data compiled by Aon Corp., which sells intellectual property and infringement insurance, shows a surge in patent litigation cases, costs and judgments. Part of the reason is vendors are more serious than ever about protecting intellectual property of all kinds, including patents. They're more serious because there's more money at stake.

"There's a realization by a lot of companies ... that they had this patent portfolio and they could go off and turn it into a profit center," says Jason Mirabito, a partner at Mintz, Levin, Cohn, Ferris, Glovsky and Popeo in Boston. He started the intellectual property practice at his firm six years ago with four lawyers. Today, there are 70 lawyers. Companies with lots of patents, such as IBM and Lucent, he says, began systematically identifying companies that might be infringing. The next step was negotiating license arrangements or hauling them into court.

Patents cover more areas than ever before, especially in high tech, and their potential effect on a company is correspondingly greater.

"Patents used to be intended to cover [mainly] gadgets," says Jeffrey Neuburger, a partner in Brown Raysman Millstein Felder & Steiner, a New York law firm with a large intellectual property practice. "But patents have broadened on the basis of some relatively new case law to cover business processes. Most software patents today are business-method patents."

Lawsuits over such patents often boil down to one party paying the other. Losers such as Microsoft and eBay — once appeals are exhausted — simply pay the judgment, along with any damages, or agree to a license fee. The direct effect on their customers is minimal.

But it's not just traditional software applications that are affected by the evolution of patent litigation. In January, Microsoft alerted the Organization for the Advancement of Structured Information Standards, a nonprofit group that designs e-business standards, that several Microsoft patent applications included elements that might be needed to implement the group's Web Services Security specification. In a statement, Microsoft pledged to provide a royalty-free license to implementers.

Similarly, companies might face the need to protect internal business methods from being hijacked or to defend them against infringement lawsuits, as their methods become available to outside customers and business partners through Web services. Web services is a new software model based on standards and interfaces found in Microsoft .Net or in Java. They can be thought of as a simple, standard way for accessing and using what in many cases had been an internal software application or even a single function in an application, such as order tracking, inventory checking or customer profiling. In effect, a company is making available its own intellectual property or possibly making use of someone else's.

"We're seeing a confirmation of [increased] patent-filing activity in this field," says Thomas Bergert, a partner specializing in intellectual property law for Williams Mullen, Clark, and Dobbins in Richmond, Va. "Companies publishing Web services or somehow creating online business efficiencies should — at a minimum — be aware these creatures [the patent applications] are out there and get informed about them."

Lawyers acknowledge that abuses of the patent system are rife.

"There is a lot of tension between patent rights and antitrust," Neuburger says. "The patent holder has the right to assert their patent rights, but not to engage in 'patent misuse' — to extract concessions that might violate the antitrust laws."

"Why do some people sue for pain and suffering?" says Ralph Taylor, chair of the intellectual property litigation group at Dorsey & Whitney, a Washington, D.C., law firm. "Because some are out to get a buck, and some really have been injured." The same is true for patent cases, he says. "You hope the court can sort them out."

The abuses could have an effect in an

See Patent, page 13

Follow the money

Patent infringement suits, many of which involve IT companies, mean big bucks these days.

- Patent licensing revenue is set to soar from $100 billion in 1998 to $500 billion in 2005.
- The average litigation cost per case is $2.5 million, with such costs typically rising 10% to 15% every year.
- At least 30 cases in the past decade have resulted in damage awards of more than $100 million.

SOURCE: AON CORP

SHARP

Digital Document Security and IT: Everything you need to know.

Q: What are the most significant digital copier security issues?

A: Various copier print controllers are actually servers that queue and permanently store multiple document files, providing administrator access to the documents. At a minimum, most digital copiers retain the last document processed; some even retain multiple documents totaling hundreds of pages. Others redirect print jobs when the printer is busy or jammed, making "denial of service" attacks possible.

Q: How does Sharp protect the network interface?

A: The Sharp Ethernet card allows administrators to restrict access and disable unnecessary protocols. With this network card, the Sharp digital copier is essentially protected by its own firewall.

Q: How can you be sure that security products actually perform as claimed?

A: The Common Criteria program—administered by the U.S. National Security Agency and the National Institute of Standards and Technology—evaluates security solutions. Products that are validated under the program meet security levels consistent with ISO 15408 methodology.

Q: How can Sharp improve IT security?

A: Sharp offers print privacy solutions designed to restrict unauthorized personnel from seeing confidential materials. Copier access can be controlled and monitored, while documents retained in printer/copier/scanner/fax memory are immediately cleared to eliminate unauthorized access.

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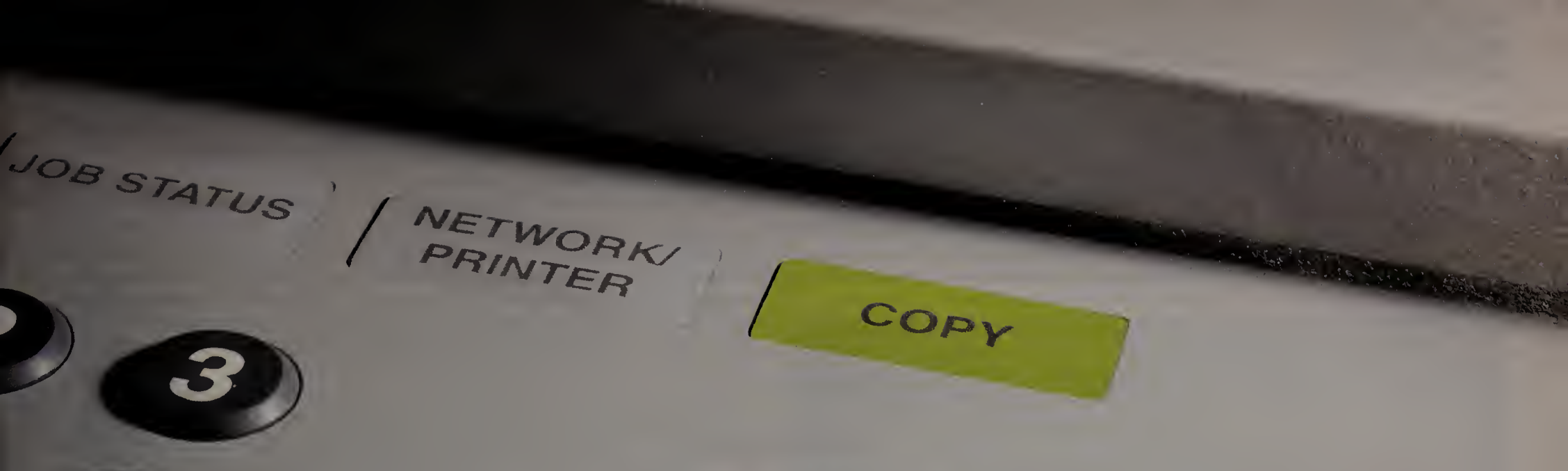

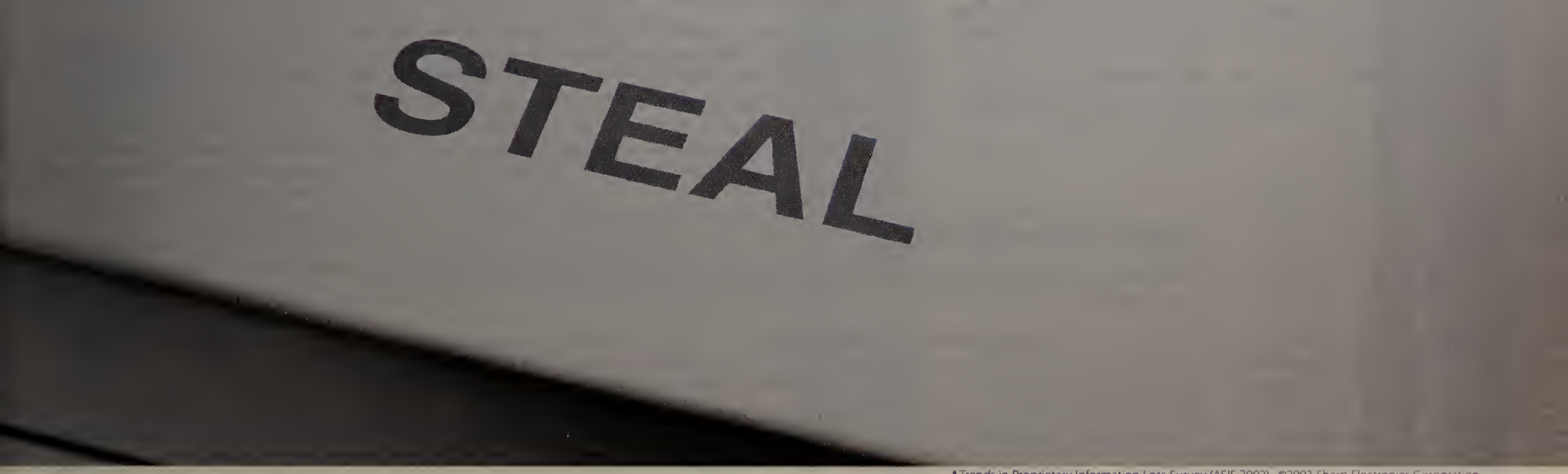

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RBOCs

continued from page 1

widespread cable telephony rollouts will begin in 12 to 18 months.

Here come the MSOs

Cable companies are becoming multiservice operators (MSO) to increase revenue by offering new voice and data services over their existing video infrastructures. These new services are facilitated by recent high-speed data communications standards and advancements, such as the Data over Cable Interface Specification (DOCSIS) and voice over IP (VoIP), respectively.

With their new service rollouts, MSOs are running directly into the pocketbooks of RBOCs, which also are trying to tap new revenue streams through DSL Internet access and remarketing of satellite TV service as their profits from traditional voice taper off.

The early results are mixed. In data, deployments of cable modems for broadband Internet access already outpace DSL by almost 2 to 1 — 11.6 million cable modem subscribers vs. 6.5 million DSL users in the U.S., according to UBS Warburg.

The overwhelming majority of those cable modem services, however, are for residential consumer use; only 5% of U.S. cable modem deployments are for home offices or mom-and-pop shops, according to In-Stat/MDR. Business DSL, meanwhile, accounts for 35% of all DSL deployments in the U.S., In-Stat/MDR says.

Some cable companies already offer circuit-switched voice services in some markets. But all are emboldened by the operational efficiencies of packet-switched VoIP and the opportunity to capture primary- and secondary-line services from the RBOCs.

"The gradual increase in cable telephony competition is expected to re-accelerate retail line loss" among RBOCs, UBS Warburg's Hodulik says.

Voice service availability from the four most-aggressive MSOs — Cablevision, Comcast, Cox and Time Warner Cable — is still spotty, however, and many are still in the trial phase with VoIP. Customers typically can't get it unless they also sign on for broadband cable modem service, though some MSOs say they soon will repeal this requirement.

Interest in cable telephony is rising, MSOs say. Some report increasing numbers of subscribers as users reap the benefits of unlimited local and long-distance service, offered at a monthly flat-rate discount, when ordered with cable TV/broadband Internet access services.

For example, Cox says it added 56,170 digital circuit-switched telephone customers in its second quarter, bringing the total to more than 800,000, an 18.4% penetration rate of the homes or businesses able to access Cox telephony. That rate represents growth of 45% from last year, according to the company.

Cox also has a VoIP test in progress in Roanoke, Va., that the company plans to to expand sometime this year, analysts say.

Time Warner earlier this year launched VoIP service in Maine that offers unlimited local, in-state and domestic long-distance for $39.95 (bundled) to $49.95 (unbundled) per month. The company has signed 2,700 subscribers, and plans to expand the service to Rochester, N.Y., and two locations in North Carolina later this year.

Cablevision began offering primary- and secondary-line voice to its OptimumOnline residential customers earlier this year. By year-end, all 4.4 million homes in Cablevision's region will have access to the company's voice service, a company spokesman says.

Cablevision did not disclose how many voice subscribers it has, but analysts put the figure at about 10,000. The company has offered voice and data services to businesses for a few years via its Lightpath unit, a competitive local exchange carrier that operates a SONET network connecting 1,500 buildings in New York, New Jersey and Connecticut.

The largest cable telephony company is Comcast, with more than 1.37 million customers, a penetration rate of 15.5% of the homes and businesses eligible for the service. Comcast, which did not respond to multiple requests for interviews, already offers circuit-switched voice to subscribers in Michigan and Virginia, and began rolling out a residential, primary-line VoIP service in Philadelphia last quarter.

But Comcast lost some subscribers and telephony revenue in the second quarter because of reduced marketing efforts, according to company statements on its second-quarter financial results. Analysts say Comcast is focusing on improving its margin and reducing its debt, following its huge acquisition of AT&T Broadband, the source of much of its telephony base (www.nwfusion.com, DocFinder: 7248).

Battling Bells

RBOCs are not standing pat. SBC and Qwest recently announced deals with cable companies' staunchest rivals — satellite TV providers — to bundle video programming into their voice, wireless and broadband Internet access packages.

SBC has an exclusive, $500 million arrangement with EchoStar to offer the Dish Network to customers within SBC's 13-state region next year. Qwest says its marketing arrangements with both EchoStar and DirecTV are slowing line losses to MSOs in Omaha, Neb., and Phoenix (DocFinder: 7249).

Together, EchoStar and DirecTV have as many subscribers as Time Warner, the second-largest cable company in the country, says Allan Tumolillo, COO of Probe Financial Associates.

"Cable companies look at satellite as the deadly enemy because once that customer goes over to satellite he's probably not going to buy anything from the cable guy," Tumolillo says. "I don't think there are a lot of cable modem customers who do not take cable television."

Verizon and BellSouth have yet to divulge their video bundling plans, but observers expect them also to sign deals with EchoStar and DirecTV. Verizon says its long-term triple-play strategy will be based on fiber-to-the-premise (FTTP), which the RBOC says it will start deploying next year (DocFinder: 7251).

Observers, however, say the RBOCs will be slow to invest in and deploy FTTP while they enhance DSL and develop satellite video partnerships (DocFinder: 7252).

Broadband as Trojan horse

Yet telephony penetration is tied more closely to delivery of high-speed broadband data and Internet access service to homes and offices than to video, analysts say. That's why RBOCs have been lowering the prices of DSL service so dramatically — to stave off further penetration by cable modems that potentially could replace RBOCs' primary voice lines into homes and businesses.

For instance, in June Verizon lowered its DSL monthly fee by up to $10 if purchased as part of an unlimited local/long-distance and wireless bundle. As part of the same package, the company boosted the downstream speed to 1.5M bit/sec. SBC soon followed suit, as did BellSouth. Qwest lowered its bundled and unbundled DSL prices by $5 to $15 per month (see details at DocFinder: 7253).

The silver bullet for RBOCs, though, could be wireless, which has become very popular with businesses and consumers as the result of minutes-of-use packages that include huge numbers of minutes at very low cost. Offering attractive wireless bundles potentially can replace landline revenue that RBOCs lost to MSOs and other mobile wireless operators, analysts say.

Wireless makes SBC's triple-play bundle a "quadruple play," officials at the RBOC boast.

"Wireless is a key point of differentiation," says Gordon Brown, executive director of alliance management at SBC. "When stacked up with broadband, telephony and now video in our bundle, we think it positions us well."

See RBOCs, page 11

Stepping on toes

The cable companies, armed with new telephony services, have the RBOCs' phone customers in their sights.

Cable company	Homes passed	Telephony subscribers	% penetration	% overlap with* . . . SBC	Verizon	BellSouth	Qwest
Cablevision	160,000	10,000	7.5	7.6	78.6	0	0
Comcast	8.81 million	1.37 million	15.5	29.7	33.8	12.7	10.7
Cox	4.57 million	840,000	18.4	41	16	16	19
Time Warner	N/A	N/A	N/A	29.2	25.4	15	1.9

*Refers to homes passed by cable companies as a percentage of all primary phone-line customers in RBOC territories.

SOURCE: UBS WARBURG

Cable modem momentum

Current and projected overlap of cable modem customers with RBOC primary-line customers.

Cable company	Cable modem subscribers Q2, '03	% penetration of homes passed Q2, '03	2005 (est.)	% overlap with . . . (Q2, '03 and 2005 est.) SBC	Verizon	BellSouth	Qwest
Cablevision	100,000	31.1	48	0.3; 0.4	2.6; 3.9	0; 0	0; 0
Comcast	4.4 million	20.5	39	5.3; 10.1	5.2; 9.9	4.3; 8.2	5.1; 9.8
Cox	1.7 million	26.7	45.3	2.8; 4.7	.9; 1.6	2.1; 3.5	3.5; 5.9
Time Warner	2.9 million	26.1	46.3	3.4; 6	2.6; 4.5	3.3; 5.9	.6; 1.1

SOURCE: UBS WARBURG

In-Site Lessons from leading users **North Bronx Healthcare Network**

Bronx

continued from page 1

path and by September will upgrade its network from LAN core to edge with 10G technology, which to date has been used mostly in the unusually high-powered networks of research facilities such as Lawrence Berkeley National Labs and San Diego Supercomputing Center.

Morreale says he feared that even 1G bit/sec might be outpaced by the hospital's ballooning LAN bandwidth needs — wiring closets and the backbone were running at 85% utilization. He decided 10G in the core would be the cure.

"We've had some high-bandwidth stuff in place for a while, but we knew some even heavier stuff was coming," Morreale says. "The flat network and low bandwidth wasn't going to cut it."

In recent years the hospital added digitized medical-imaging technology, which allows X-rays, MRIs and other images to be viewed and stored on computers instead of film and videotape. Also, doctors and clinicians commonly dictate notes into their desktop PCs instead of onto dictation minicassettes. That prompted the IT staff to set up servers and storage for the bulky voice note files. Videoconferencing among NBHN staff in separate buildings also was taking off.

For procuring the 10G gear, Cisco was first on the minds of Morreale and his staff.

"We had such a good track record with them, we thought it would be a straightforward upgrade," Morreale says. As a city-managed entity, NBHN must put out competitive bids for any major projects. This gave vendors such as Cisco, Enterasys Networks, Extreme Networks and Nortel a foot in the door.

While the upgrade has been smooth, Morreale says a couple of unexpected costs came up.

The decision came down to Cisco and Extreme, Morreale says, and the hospital chose Extreme "based on price and functionality." The total network upgrade cost $3.5 million, plus installation from Extreme, he adds. He wouldn't say what the Cisco bid was, only that the Extreme price was "significantly lower."

In July, NBHN upgraded its core and distribution layers, which consist of two Extreme BlackDiamond switches in the core linked to BlackDiamonds in two adjacent buildings via 10G running over redundant fiber. BlackDiamonds soon will hook up the entire server farm — 100 nodes — with Gigabit connections, with 10G running back to the core (see diagram, page 16).

Sixty-five wiring closets are being deployed with a mix of Extreme's Alpine chassis switches and Summit stackable switches, providing mostly Fast Ethernet links to about 8,000 PCs and other

See Bronx, page 16

RBOCs

continued from page 10

SBC and Qwest have yet to see any MSOs in their regions partner with a wireless operator or disclose any wireless plans. But analysts say it's a must in an MSO bundle.

"Cable comes to the table now with a bundle that excludes wireless," Probe's Tumolillo says. "The cable companies need to find some partners on the wireless side."

The cable advantage

An advantage for the cable companies could be their heritage in video, though satellite use also is growing each quarter, analysts say. Another perceived advantage could be the ability of MSOs to offer services over a single common infrastructure, SBC's Brown says. RBOCs provision their bundled services over multiple facilities, such as satellite video, that they don't even own.

"Is that a true bundle? It won't be as convenient or efficient or as compelling as what cable is offering," says Mike Paxton, an analyst at In-Stat/MDR. Remarketing arrangements have failed in the past. We'll have to see how they really offer it and how they price it and what kind of synergies really exist before we can say that's a real competitive service bundle to what the cable guys are offering."

A true bundle is in the eye of the beholder, Brown says.

"If the customer experience is seamless and the billing experience is seamless, I don't think [a common facility] necessarily resonates with the customer as an advantage," he says.

So it's too early to call who has the overall advantage in offering a triple-play bundle. Cable companies have the majority of broadband access subscribers and the "bundled" infrastructure; RBOCs have wireless and the business presence.

"If people want really high-speed Internet, the edge may tilt toward cable," Probe's Tumolillo says. "If the decision is, 'I'm OK with DSL,' then the telcos have the edge because they have mobility, and they can get you everything else that you need. After that, it gets very dicey." ■

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Clarification

■ In a story headlined "NetWare at a crossroads," published on page 1, Aug. 11, a quote from IDC research director Al Gillen may have been misinterpreted. Gillen's comment was related to Novell's potential to become relevant to customers outside its existing NetWare customer base, and that Linux, not Novell's Nterprise Linux Services, gives the company an application server platform.

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Due to a layout error, this listing appeared incorrectly in our 7/21 issue. Network World regrets the error.

Chip vendor claims wireless breakthrough

■ BY JOHN COX

A start-up is sampling a chipset that it says will improve dramatically the range and performance of wireless LANs, and eliminate current security problems.

Airgo Networks' chipsets blend advances from several technologies. The result, CEO Greg Raleigh says, will be WLAN access points with two-and-a-half to five times the range of existing products and at least two to four times the throughput of existing WLAN products. They also will maintain throughput at longer distances, he says.

Airgo chips for 802.11a could reach 300 feet or more and support a minimum throughput of about 34M bit/sec. The maximum 802.11a data rate is 54M bit/sec, with a range at that rate of about 100 feet. (It can reach further but the rate drops.) Actual 802.11a throughput typically is in the 17M to 22M bit/sec range.

Those kinds of numbers, if proven, could dramatically lower WLAN installation costs by sharply cutting the number of access points that have to be installed and, most importantly, wired into the existing cable plant.

Airgo has achieved its advances by turning chief weaknesses of radio technology into a strength through something called multiple-input multiple-output (MIMO) technology. The weakness is a characteristic of radio: When you transmit a radio signal from one antenna, the energy bounces off various items, such as cabinets and walls, creating multiple signal paths to a receiver that's not in a direct line of sight.

This is called multi-path propagation, which distorts the overall signal. The receiver takes the best signal path and processes it.

Airgo's chips send and receive via multiple antennas: client cards would have two, access points would have three. The antennas collect all the signals, and Airgo's algorithms combine and process them to create the best possible reception.

"We've taken what had required $100 worth of silicon and reduced it to tens of cents," Raleigh says.

The chips contain the full range of security standards: Wired Equivalent Privacy, Wi-Fi Protected Access, VPN termination, 802.1x authentication and Advanced Encryption Standard.

Airgo is not alone in trying to advance wireless silicon. Aether, Broadcom and Intel are major players, and all are working with MIMO. Other rivals are start-ups such as Engim (see www.nwfusion.com, DocFinder: 7246, with more details from Kevin Tolly, DocFinder: 7247).

The company has signed contracts with electronics makers, and is in talks with WLAN hardware vendors that take the boards and incorporate them into finished access points or client adapter cards. Raleigh declined to name these companies. He expects the first Airgo-powered products to be available by year-end. ■

Nimbus

continued from page 1

updating patches, analysts say.

According to sources, Nimbus will be an amalgamation of HP's server management tools: Insight Manager, the old Compaq technology that monitors Windows and Alpha servers, and Servicecontrol Manager for HP-UX and Linux systems. HP Toptools Device Manager, which managed multiple platforms, was discontinued last year, but its features are expected to be integrated in Nimbus.

HP declined to comment on Nimbus, but sources say a base version is expected to ship with HP servers within months.

The package is an upgrade to Insight Manager, which brings HP's management and monitoring expertise to the legacy Compaq product, says Jason Robohm, director of technical services at Crossmark Holdings in Plano, Texas. Crossmark, which is testing the Nimbus software, is a longtime ProLiant customer.

"The advantage for us is we're seeing thinner and thinner load on the server and more [remote monitoring] and SNMP-type polling, which means you have less overhead and fewer things to update in the way of agents," Robohm says. "That's the direction where we see this new version of Insight Manager heading: almost an HP OpenView look and feel, but not meant to be providing network-related uptimes and correlation, but instead give you the kind of information about a specific box and performance of that particular box.

"So it's collecting all the information like Insight Manager used to, but saying 'I'm not worried about operating system differences because I'm using industry-standard ways of gathering information,'" Robohm says.

The capabilities in Nimbus are important, analysts note, because server management software feeds into larger, higher-level network management systems such as HP OpenView and IBM's Tivoli product, which are used to manage heterogeneous servers, storage and other resources.

"The last few versions of Insight Manager have been pretty advanced for server management," says Jamie Gruener, a senior analyst for The Yankee Group. "To consolidate Insight Manager with HP-UX management is awesome. It's been a common problem for server management — having different tools for different server operating systems."

Insight Manager identifies, isolates and resolves problems on HP ProLiant servers, blades and their Alpha servers; Servicecontrol Manager performs fault monitoring, configuration and workload management of HP-UX or Linux systems; and Toptools performed fault and inventory management on former HP Netservers and HP-UX machines.

With Nimbus, users will no longer have to jump from console to console to control the various server nodes on their networks. Instead, they will have an integrated view of systems running Windows, Linux and HP-UX.

Today, server management software from all systems vendors require console-hopping to manage heterogeneous systems. IBM, for example, has IBM Director to manage servers running Windows, Linux and NetWare, but AIX systems are handled through different software. Sun's Sun Management Center will handle only Solaris running on scalable processor architecture and Intel-based boxes, although there are plans to extend that software to encompass Linux, analysts say. Sun's Cobalt appliances use the Sun Cobalt Control Station software, Sun officials say.

But while the focus has been on server consolidation, "the management stuff has lagged behind," says Jonathan Eunice, principal analyst at Illuminata. "Management, from a user point of view, is one of the first places you should go. IBM has been counterintuitive about working on hardware consolidation before working on management consolidation. Only this year have they talked about managing other IBM platforms such as AIX."

Eunice says users should expect vendors to move in this direction, however, as barriers collapse in data centers with Unix, Linux and Windows environments working more in tandem as workloads are consolidated.

"Today, IBM Director is included with the purchase of our xSeries servers," says Ted Mazanec, product manager for IBM Director. "IBM Director supports all Intel-based hardware, but going forward, we will be converging some of our systems management tools so that we have a common management platform and console for customers who want to manage beyond Intel. [With IBM Director] the customer would not have to use different tools."

Users say an integrated server management system will be a boon in the data center.

"It will make operations a little more seamless for us," says Mark Deck, director of infrastructure technology for NMHCrx, a pharmacy benefit manager in Port Washington, N.Y. He says an integrated tool will eliminate the headache of having to implement and run two separate management packages.

Crossmark's Robohm agrees. "The ability for Crossmark to look at its entire fleet of servers in a Wintel environment and in Linux environments in a single reporting engine is important because it allows us to look at one place and see the health of an entire mission-critical infrastructure," he says. "The other option is we would have to look at almost a Batman's [utility] belt worth of reporting solutions and then try to aggregate that information together to get a concise picture of the uptime and status and health of our infrastructure."

What it boils down to is better efficiencies and cost savings in the long run, analysts say.

"A consolidated platform takes fewer people to run everything," says Terry Shannon, an analyst at consulting firm Shannon Knows HPC. "If you're running ProLiants and Superdome with Linux in one partition, HP-UX in another and Windows in another, do you want to have four management [packages], or do you want to have one?" ■

Server management suites

Vendors have a variety of software to integrate into server management packages, which discover, monitor and control servers on the network.

	Intel	Unix	Linux	NetWare
Dell	OpenManage	N/A	OpenManage	OpenManage
HP	Insight Manager to become Nimbus	Servicecontrol Manager, Insight Manager to become Nimbus	Servicecontrol Manager, Insight Manager to become Nimbus	Insight Manager to become Nimbus
IBM	IBM Director	Web-based System Manager for AIX, SystemView System Manager for AS/400	IBM Director, MSYS; EREP; RMF	IBM Director
Sun	Sun Management Center	Sun Management Center	Sun Cobalt Control Station	N/A

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Blaster

continued from page 1

(DoS) attack on its Windows Update Web site the next day by the compromised machines.

Blaster, which quickly took its place alongside Code Red, Nimda and MS-SQL Slammer as one of the most disruptive worms in history, also has begun spawning variants — including one called Teekids — that could do damage of their own. Concerns also were mounting that there is a separate DoS vulnerability in Microsoft's Remote Procedure Call (RPC) interface that also can be targeted and that might require another round of patching.

Blaster, which spreads by scanning for Windows XP, NT, 2000 and 2003 machines that never were patched for the RPC vulnerability discovered last month, wreaked havoc with networks across industries, including education, banking and government.

Productivity drain

"This has been a huge productivity drain," says Tom Danford, associate provost and CIO at the University of Dayton in Ohio, which had several LAN sub-nets infested with Blaster scanning. "We don't have much control over the students' computers on these LANs."

Big blast

Estimates vary widely — from a few hundred thousand to 20 million — as to how many computers Blaster infected.

The university blocked Blaster, which slipped in via Port 135, at the Internet gateway by using an intrusion-prevention appliance from TippingPoint Technologies. But that didn't help stop outbreaks that started inside the network as students turned on unpatched machines infected elsewhere.

Danford says he expects more outbreaks as students return en masse to campus Aug. 23. The IT staff is preparing a Blaster "awareness" campaign to encourage everyone to ensure their PCs are patched.

Companies in the business of securing IT networks were quick to offer estimates on the overall damage caused by Blaster, also known as MSBlast and LoveSAN. Security outfit RedSiren, for instance, pegged the damage in lost productivity as IT staff went about checking for and cleaning up infected computers at $320 million, not counting business-related losses.

TruSecure's Russ Cooper pressured Microsoft to patch a version of Windows 2000 it initially wouldn't support.

The Federal Reserve Bank of Atlanta and the Maryland Motor Vehicle Administration in Glen Burnie shut down their offices last Tuesday as network staff there eradicated Blaster outbreaks that rendered LANs useless through excessive scanning. The Maryland organization sent out a SWAT team that night to all 23 of its offices to detect and eradicate the Blaster worm on 1,700 computers and patch them, a spokesman says.

Also affected were the Cox newspapers, which suffered disruptions across a shared backbone. They also had limited Internet access at one point.

Patching process

In light of such problems, the issue of patching to prevent Blaster infection was a much-debated subject in corporate IT departments last week.

Some IT staffs came to the belated discovery that the patch Microsoft issued July 16 doesn't work on all four Service Packs (SP) for upgrades to Windows 2000. Officially, Microsoft has indicated the patch applies only to SP3 and SP4 because the company doesn't develop patches for older, "unsupported" releases such as SP1 and SP2.

But many organizations using older versions of Windows 2000 went looking for a patch last week as Blaster rocketed across the Internet. The online computer-security forum NTBugtraq, moderated by Russ Cooper of managed security services vendor TruSecure, focused its discussion on analysis that showed that the MS03-026 patch needed to stop Blaster would work on Win 2000 SP2.

The NTBugtraq debate and cry for patch support got Microsoft's attention: The company took what it said was the unusual course of acknowledging the patch does work for SP2.

"It just wasn't tested for SP2," says Stephen Toulouse, security program manager for Microsoft Security Response Center. In stating support for the patch on SP2, he says Microsoft was breaking with its customary "life-cycle policy," which can create a "weird time zone" in terms of patching.

"I believe SP2 is the most widely deployed version of Windows 2000 in corporations today," Cooper says. "Companies will have to wait until all or most of their software suppliers support an SP before they will upgrade. Many [software vendors] haven't stated they support SP3 yet despite SP4 being available. Ergo, many companies have stayed on SP2."

Toulouse says he doesn't think Microsoft has information on what SPs its customers are using.

However, the MS03-026 patch doesn't work for SP1, and that had some organizations rapidly upgrading.

The University of Denver's business school computer lab, which uses Win 2000 with SP1, determined that it took only 4 minutes early Monday evening for the worm to tear into 90 machines. Ken Stafford, vice chancellor of technology, says he immediately blocked Port 135 when he determined what was happening. The worm eventually infected 500 desktops and had 100 people scrambling to protect systems.

"On Tuesday, we were blocking 52,000 hits per minute at our firewall," Stafford says. "All the blocking brought our firewall to 92% of CPU usage, which slowed everything."

The university removed the worm with tools from Sophos and Symantec, but found Microsoft Office disabled and tough to reinstall.

The school upgraded its Win 2000 machines to SP4 and installed the patch, but still wasn't able to reload Office until the machines were disconnected from the Internet. ■

Protecting against Blaster

Experts recommend a number of steps, both general and specific:

- Patch every machine under your administrative control.
- Direct users outside your control (on campus, for example) to get a patch at windowsupdate.microsoft.com (alternate site, if needed, is www.microsoft.com/download) and to scrub for infections.
- Direct users to vendor sites such as Symantec's that have free detection and scrub tools.
- Use firewall or other gateway protection to block Port 135 inbound and outbound where Blaster travels.
- Also block Port 69/UDP, 139 TCP and UDP, 445 TCP and UDP, and 444 TCP.
- Do not block Port 135 inside the corporate network, because it renders many Microsoft-based applications unusable.

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Patent

continued from page 8

arena that's often overlooked, but one that could affect enterprise users: standards groups. Such groups typically have policies that require participants to disclose any patents or patent applications that could be infringed by the implementation of the standard being created, such as one for Web services security or a radio modulation technique in the IEEE 802.11 wireless LAN standard.

Participants usually agree to declare these patents and give up certain rights, says Andrew Updegrove, a partner with Lucash, Gesmar & Updegrove, a Boston law firm that specializes in working with standards groups. The firm just filed a "friend of the court" brief with the U.S. Supreme Court in Rambus v. Infineon, a patent case that's been dragging on for a decade. Updegrove and others contend that Rambus participated in a group that creates standards for memory chips, then withdrew at the last moment and revealed several patents that it claimed were being infringed. Insiders call this a "submarine patent" because it surfaces out of nowhere.

If Rambus prevails, Updegrove says, patent holders will hesitate to join standards-setting efforts or abandon them altogether.

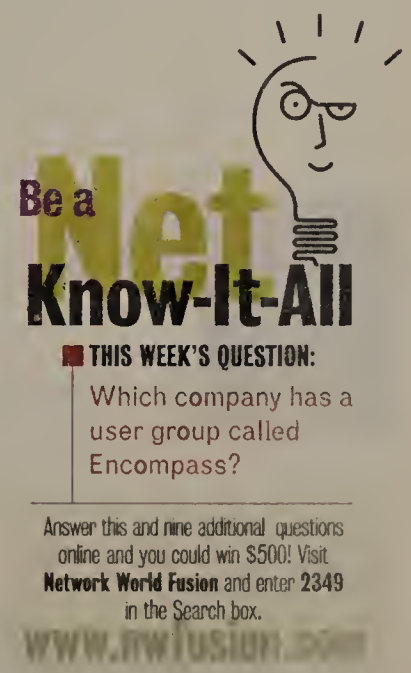
In May, the Worldwide Web Consortium, a nonprofit group that oversees Web standards, formally adopted a royalty-free patent policy. The policy requires all participants to agree to license, without royalties, any patents that threaten to block interoperability.

Many of these issues and decisions are beyond the control of network executives. But they can take steps to protect their companies.

One key measure is to incorporate a very good indemnity agreement in contracts with your high-tech suppliers, Mirabito says. If a patent holder forces you to pay a license fee, the indemnity clause will let you get repaid by the vendor.

With software, especially, "ensure the software is not infringing" on anyone's patent," Taylor says. "There are contractual provisions that you can put into a software license that can give you some protection against this."

Consider patent infringement insurance, Mirabito says. But be prepared to pay for the protection it offers. "It's relatively expensive," he says. "But it protects you if you get sued by paying the legal fees and so on." ■



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In-Site Lessons from leading users **North Bronx Healthcare Network**

Bronx
continued from page 11

network devices.

Gigabit to the desktop also will be in place to support new medical-imaging systems.

"The bandwidth involved with that is not insignificant," Morreale says. For a doctor to view a graphic file, such as an X-ray or cardiology image, involves a 200M-byte file download. "Those PCs generate a huge amount of traffic." Summit switches will provide the ports for about 50 Gigabit workstations.

While the upgrade has been smooth, Morreale says a couple of unexpected costs came up during the project — both having to do with electricity.

The new core switches required "twist-lock" power outlets — plugs that prevent a power cord from being kicked loose — which were not present in the hospital's computer room. This required an electrician call. Also, because the switches in the wiring closets use more power than the hubs they're replacing, Morreale says ventilation will need to be installed to keep gear in the closets cool.

"These things weren't issues with our old hubs," he adds.

Morreale says he can live with these incidental labor costs because the Extreme switches will provide new Layer 3 features for the LAN core and edge traffic, such as quality of service for latency-sensitive applications. Routing also will let segments of the network be put into subnets. This will protect traffic such as image file transfers from broadcast storms, which sometimes happen on a NBHN LAN running a mixture of modern and legacy protocols.

Morreale says he did not consider mixing and matching core and wiring-closet LAN gear from various switch makers because he wanted the network to run as an easily managed system, with as little tinkering as necessary from his staff.

"We're making a quantum leap in technology," but not in IT staff, he says. The Extreme switches all run ExtremeWare, the vendor's management platform that can let NBHN IT staff monitor and change the configuration of any port in the company, Morreale says.

"I want to keep the network robust with plenty of room to grow."

Dan Morreale
CIO, North Bronx Healthcare Network

Future budgeting considerations were also a factor in the decision to forgo Gigabit Ethernet for 10G in the core.

"I want to keep the network robust with plenty of room to grow," Morreale says. "So we put in some really big stuff — maybe more than we need — for now. We will grow into it over the next few years."

He says the 10G installation also will put off the next upgrade well into the future, which sounded good to his budget people. "We don't like to keep going back to the well for more money for network costs. That's another reason why we overbuilt" the network in the blueprint, he adds. ■

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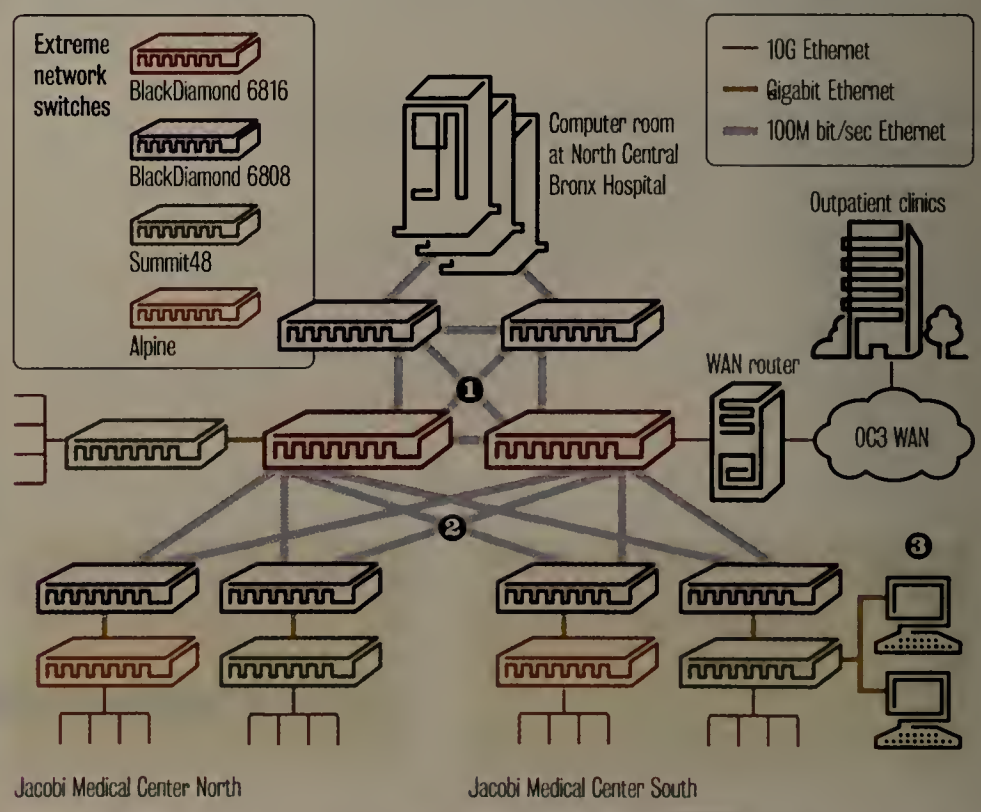
Quantum leap

North Bronx Health Network is in the process of a $3.5 million network upgrade, moving from Fast Ethernet to 10G Ethernet in the backbone.



1. All traffic is collapsed to two BlackDiamond switches in the core, outfitted with 10G Ethernet line cards.
2. Fiber running to nearby Jacobi Medical Center buildings supports 10G links back to the core.
3. A mix of Alpine chassis switches and Summit stackable switches provides most users with 100M bit/sec links; some medical-imaging PCs receive Gigabit connections.

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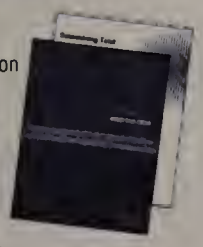

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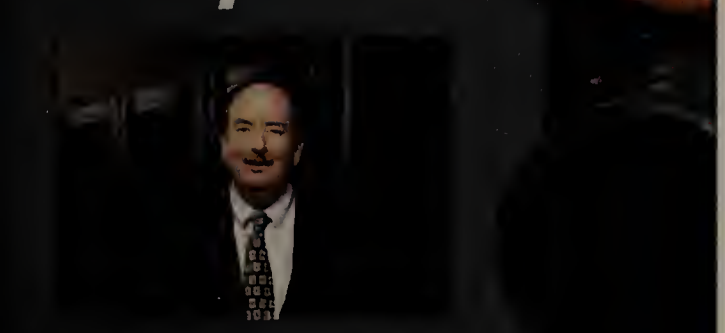

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by Russell Senesac
InfraStruXure Product Manager

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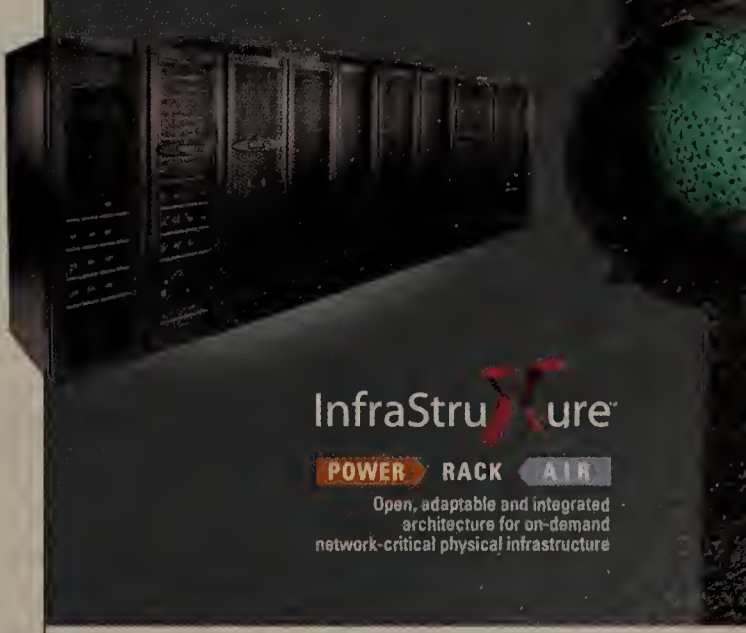

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Money remains tight for IT start-ups

Venture capitalists investing in companies that have already proven themselves.

■ BY TIM GREENE

First-time investments in IT companies in the second quarter lagged behind such investments in general, indicating that the network sector has not turned around yet, according to a survey of venture capital firms.

While the total number of companies receiving first-time funding rose slightly in the last quarter from an all-time low of 138 to 153, IT start-ups didn't fare as well.

These network industry statistics were supplied to *Network World* by three organizations that compile the quarterly MoneyTree Venture Capital Survey: PricewaterhouseCoopers, Venture Economics and National Venture Capital Association.

In the network industry categories — computers and peripherals, IT services, networking and equipment, semiconductors, software and Internet communications — only 63 of 338 deals were for first-time funding. That is about 18.6%, down from the previous quarter's mark of 21%.

Part of the reason is that big corporations are not spending as much on IT infrastructure, says Todd Dagres, a general partner at Battery Ventures. "Now they're protecting their turf. They've already built their infrastructure and in this environment are looking to take advantage of what they've put in the ground, not expand it," he says.

Exceptions to the rule are in the areas of storage and security, says Tracy Lefteroff, global managing partner of the venture capital practice at PricewaterhouseCoopers. Security firm CoreStreet received $4 million in start-up money and is poised for another round, CEO Peter Hussey says. "There's probably never been a time in our history with more focus on security," he says.

Even so, venture firms seemed more cautious, with more of them interested in funding later rounds but not as willing to make initial investments, Hussey says. In addition to focusing on security, CoreStreet also seemed more attractive because it already had a product in beta tests with government agencies, and the founding team had run successful start-ups before, Hussey says. The company also is sitting on 14 U.S. patents for its technology, he says.

Web-services infrastructure start-up Active Endpoints received $6.5 million and found the scrutiny by venture capitalists to be more intense, says Fred Halohan, company president. Investors are trying to determine when large corporations will start buying. "When will the economy rebound enough so innovative customers will step up and buy again? Now they have their horns pulled in," he says. The venture-capital firms he spoke with seemed concerned about companies they invested in earlier but are not yet profitable.

"[Investors] are supporting what they already had on their books," Lefteroff says. "The majority of the money is going to support existing companies in later-stage deals."

With Active Endpoints marking his third start-up, Halohan says his past successes also might have helped. "We've had two prior ventures, and we haven't lost anyone's money yet. There's something magical about that," he says.

Investment in software companies remained high, with $864 million invested, up from $810 last quarter. That is partly because software is a broad category ranging from consumer to service provider, but also because software companies deliver products faster than hardware companies, Dagres says.

First-time investment in telecom companies was at a new low — only two start-ups got funding. That lag, plus ongoing consolidation among existing providers, could result in less choice for business customers, who then might start spending to create their own wide-area services, Dagres says. Overall investments in telecom start-ups actually increased 21% to $615 million, but that was for second- and third-stage investments, the survey says.

Investment in companies that make network equipment for businesses also was down for the quarter, from $458 million to $427 million. One reason is that a few major vendors dominate this market, making the prospect for tiny competitors bleak, Lefteroff says.

For more information on the MoneyTree survey, go to www.nwfusion.com, DocFinder: 7250. ■

Getting started

With venture funding tight in the second quarter, some network start-ups nevertheless managed to score their first round of funding.

Company	Investment	Business
Broadmargin	$21M	Network consultants
RackSaver	$14M	High-density rack-mount servers
Ammasso	$10M	Gigabit Ethernet clustering cards
Scalix Software	$13M	Linux-based e-mail software
Procuri	$10M	E-commerce software
Active Endpoints	$6.5M	Enterprise servers
CoreStreet	$4M	Security software

SOURCE: MONEYTREE SURVEY Q2, 2003

MoneyTree QUARTERLY Venture capital Survey

Wireless mgmt. software gains Microsoft hooks

■ BY JOHN FONTANA

Sonic Mobility this week is expected to add support for Microsoft Exchange and Active Directory to its mobile wireless system-administration software.

Sonicadmin 3.0, which runs on Microsoft Pocket PC and RIM BlackBerry devices, gives network administrators the ability to securely manage devices such as switches, routers, servers and network applications, over a wireless connection from a handheld.

"What's significant here is that someone doesn't have to be chained to a desk," says Mike Jude, an analyst with Enterprise Management Associates. "You have more flexibility, and the fact that Sonic is expanding the reach of its software is a good thing."

Support for Exchange 2000 lets users add, modify and delete mailboxes; edit Simple Mail Transfer Protocol proxy addresses; manage storage limits; and view queues. With Exchange 2003, users also can manage queues and the messages inside those queues.

Administrators using Active Directory can perform actions such as adding or removing users from organizational units and changing permission settings on those units. They also can manage local and domain users, and edit and set user-account expiration dates.

The new version adds support for RSA Security's SecurID two-factor authentication to secure access to a network before accessing the Sonicadmin server, which runs on a Windows server. The Sonicadmin server supports Triple-DES encryption and matches an administrator's logon with the logon on the target network device or server to ensure the correct set of permissions is assigned to the user.

Sonicadmin 3.0 also supports VT-100 terminal emulation for network devices that require more than a command-line interface for administration.

Compression technology new with Version 3.0 is designed to make Sonicadmin run faster over any wireless connection.

Sonic Mobility's software competes with similar offerings from Expand Beyond, Sessionware and Allen Systems Group.

Sonicadmin 3.0 starts at $2,500, which includes the licenses to manage 10 servers and 10 network devices. The software is available as a free upgrade for those who have licensed Windows Server 2003 Mobile Admin Pack, which is based on the Sonicadmin software. ■

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Short Takes

■ **SMC Networks** last week continued its Gigabit product push for small and midsize networks with its **EZ Switch** 10/100/1000M bit/sec boxes. Versions of the switch come with five or eight ports of triple-speed Ethernet connections. The five-port EZ Switch costs $130, and the eight-port costs $180. SMC also announced a $30 Gigabit-over-copper network interface card, the EZ Card 1000. The NIC supports 32-bit PCI server and PC hardware, and will be available next month.

■ **Maxxan** this week will announce its intelligent multi-protocol Fibre Channel switch. The **MXV320** has as many as 320 ports that can be configured for Fibre Channel, Gigabit Ethernet or Fibre Channel over IP connectivity. The iSCSI protocol will be supported in the future, the company says. Line cards, which run applications such as FalconStor's IPStor virtualization, snapshot backup and replication software or Veritas Software NetBackup, can be added. The company also is shipping the SA100f, an appliance that could be placed in a remote office for replicating data to the data center, backup and recovery, and virtualization. The MXV320 with 64 Fibre Channel ports and two application line cards is $167,900. The SA100f with replication capability is $37,500.

■ **Raritan Computer** says it has the answer for companies tired of sending IT staff to remote locations to manage hardware. A new product, called **Dominion KSX,** integrates KVM, serial and power control with IP access technologies to let customers manage equipment such as servers, switches, routers, PBXs and power strips via a Web browser. Users log on to the Web-based console using single sign-on to get a real-time graphical view of all the IT equipment connected to the KSX, and then can troubleshoot, configure and maintain the hardware. The single-box appliance starts at $3,400 for the KSX440, which has four KVM ports, four serial ports and one power control port.

Backup as a way of life

Lifeline Systems must be there when you've fallen and can't get up.

■ BY TIM GREENE

FRAMINGHAM, MASS. — At Lifeline Systems, everything must have a backup because the company can't tolerate interruptions to its daily business: fielding tens of thousands of help calls from customers who are in potentially life-threatening situations.

That's why last fall when the emergency-call-response firm needed more room, it chose to open a separate facility that would give it the space it needed but also act as a fully functional stand-alone call/data center. If catastrophe were to strike the primary facility, the second one could keep the business going. "We can never have a call abandoned," says Lifeline's CIO Richard Reich. His staff designed and implemented its plan that went live earlier this summer

Lifeline, the "I've fallen and I can't get up" company, has 340,000 customers who wear Lifeline pendants or bracelets with buttons to push in emergencies. These devices send 312M Hz wireless prompts to other Lifeline devices in customer homes called communicators. These look and act like speaker phones and, when triggered, dial Lifeline's call center in Framingham.

At the call center, receiver devices determine within seconds whether the unit went off by itself because its battery was low or because somebody pushed the emergency button. If the latter, the call is placed briefly in a queue while a record containing that customer's information is drawn from a database.

The communicator also relays its unique ID number that is used to tap Lifeline's Oracle database for details about the customer associated with the unit. This information includes the customer's name, address, phone number, names and phone numbers of responders (friends, neighbors, relatives), and the phone numbers of local emergency services. It also lists physicians and other people to notify in case of an emergency if those people are not among the responders.

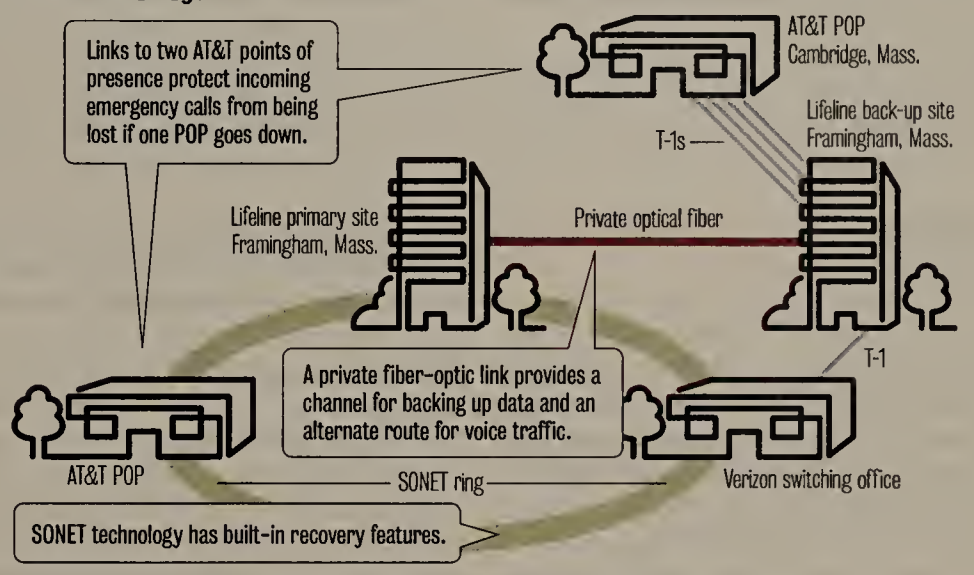
Genesys Telecommunications Labs computer-telephony integration software from Siemens gathers this information from the database and displays it on call agents' workstations when they pick up calls.

Lifeline always has wanted to make sure

See Lifeline, page 20

Department of Redundancy Department

Lifeline's call centers must be working at all times in order to provide emergency services to its customers, so its two call centers are designed for resiliency.



HP eases management of storage tape libraries

■ BY DENI CONNOR

HP is embedding technology in its storage tap libraries that should help users manage the migration and movement of data more easily, the company says.

HP recently announced the StorageWorks Extended Tape Library Architecture, which consists of an integrated E2400-160 FC Interface Controller that links tape drives to storage-area networks (SAN), and an Interface Manager, which contains software that can be used to monitor the health of the library. The Interface Manager card in each controller communicates with HP's CommandView management console, which can gather information about the health of the library, configure the device and optimize its performance.

With this technology and with a controller in front of a library of tape drives, the company can install applications on the controller that make libraries easier to manage, control and migrate data to. Competitors such as ADIC and Quantum say they already have similar technology in place.

Unlike disk drives, which attach to the SAN via a controller interface, tape libraries typically attach directly through Fibre Channel connections or a SCSI-to-Fibre Channel router to SAN switches. When attached in this fashion, users rely on separate software to monitor the health, performance and other features of the tape drives. In some cases, applications such as replication, serverless back-up and virtualization have resided on separate host computers. Those characteristics now are coming to tape, HP says.

Companies with mainframes are familiar with intelligent storage controllers. IBM and StorageTek have implemented them in their Virtual Tape System and Virtual Storage Manager, in which a controller-type device is placed in front of several libraries and distributes and migrates data to the tape device transparently to the back-up application. Several other companies, including Computer Associates and

See HP, page 20

TOLLY ON TECHNOLOGY

Kevin Tolly

Ethernet NICs: Are they really a commodity?

At Circuit City last week, a glance to one side stopped me dead in my tracks — it was a Fast Ethernet PCI network interface card for $4 and change. When a LAN interface costs about the same as a combo meal at Wendy's, you have to wonder — is the NIC just a faceless, nameless commodity?

Like pork bellies, soybeans, wheat and light crude, is buying NICs all just about volume and price? And, with more and more PC and notebook vendors using integrated "LAN on Motherboard" approaches, you've got to ask yourself whether there is even a point in being concerned about the differences. Is anyone really going to change his PC preference because of the LAN interface? Not likely.

Still, there are significant differences among NICs. And, while these differences might mean little to home consumers, they can have a big impact on overall manageability and total cost of ownership in corporations.

A search of network gear supplier CDW's Web site shows that Fast Ethernet PCI NICs can be had for as low as $11 (Linksys) and upwards of $70 (Intel) — with Fast Ethernet server adapters in the $80 to $100 range (more, typically, if outfitted with a fiber-optic interface). So what are the differences?

A set of features important to both client and server NICs is "manageability." It's not hard to find NICs that label themselves "managed," but it is often a challenge to determine what exactly vendors mean by it. It would seem that some of them define managed as being "not NOT managed." That is, once they implement any function that can be construed as letting some element of the NIC be managed (like assigning a locally administered address), voilà — they have a managed NIC.

But really, it means having features like "Wake on LAN" (WoL) or support of the pre-execution environment (PXE). WoL lets the NIC trigger a system boot on receipt of a specific packet. PXE allows for special management software to load and execute before the Windows boot loader gets control of the CPU.

Less esoteric and more useful on a day-to-day basis are management features that help isolate and debug connectivity problems. While many of these functions are available via arcane command-line interfaces, having them easily accessible via a GUI will simplify the job for the help desk and let some users fix their own problems.

Vital signs are essential. These displays tell the user about the addressing and operational status of the NIC. If the NIC doesn't have an IP address, for example, you often need to look no further to solve your problem. Features that allow "loopback" at Layer 2 and Layer 3 (i.e., "ping") also can come in handy.

Server adapters offer up an even broader array of options based, unsurprisingly, around performance.

The more subtle performance features, though, are destined to help as well — and here it is all about "offload." Even "commodity-class" server NICs are offering some basic offload of checksum calculation, TCP segmentation, IPSec termination and the like. Formal and informal testing of these features by The Tolly Group have shown that these translate into demonstrable benefits especially when pushing through Fast Ethernet to Gigabit Ethernet levels.

So for enterprise nets, don't be lulled into thinking that all NICs are created equal.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Manasquan, N.J. He can be reached at ktolly@tolly.com.

Lifeline

continued from page 19

its phone system was as redundant as possible, Reich says, so it had Verizon install a private SONET ring between its original 100-seat call center at headquarters, and Verizon's local central office. SONET's built-in redundancy leaves phone service uninterrupted if the SONET ring is cut.

The ring also is connected to the local point of presence for AT&T using eight T-1s worth of bandwidth. AT&T supplies Lifeline's long-distance and 800 number service and backs up local phone service if the Verizon central office fails.

When it added the second 62-seat call center a quarter-mile away from the first, Lifeline wanted to increase redundancy in its telecom infrastructure.

So it connected the new building to the local Verizon switching office via a T-1 and to an AT&T POP about 20 miles away in Cambridge via four T-1s. Finally, Lifeline dug a trench and installed 48 strands of optical fiber directly between the two Lifeline facilities that connect their phone and data systems (see diagram).

To make best use of the two call centers, Lifeline is signing up for an AT&T service that allocates a certain percentage of calls to one center and the rest to the other. Lifeline would have control over those percentages and could adjust them at will via a Web interface or by phone, Reich says.

The facilities even have freezers storing food to feed the staff in an emergency, uninterruptable power supplies and diesel-powered back-up electrical generators. Portable generators can be trucked in and connected should the backups fail, and Lifeline has priority contracts with fuel suppliers so the backups could run indefinitely.

Inside the centers, Lifeline has installed redundant voice and data systems. Each has its own Avaya PBX. Lifeline receiver devices and workstations. Business workstations are designed to convert quickly to call-center workstations in emergencies. They each also have primary and back-up computer-telephony integration databases and servers; in-house CareSystem databases and servers; and archive databases.

The databases are replicated across the private fiber connection, and if the fiber were cut, the call centers could continue to operate independently until the break was fixed, says Bill Rebello, director of infrastructure and support for Lifeline.

The company has two T-1s for Internet access at the main office and one at the backup for redundancy. The company is getting ready to bond the three together into a single logical link as it considers a peer-to-peer VPN for its seven regional offices. Each regional office connects to the Internet via T-1 and has a Cisco VPN-enabled router. VPN links are terminated at the main site in Framingham on a PIX VPN firewall, and there is a redundant PIX at the second building. Before the second site went live, there were two PIX firewalls at the main site.

The regional offices have conventional phone systems for handling customer service calls, but don't handle emergency calls. Business data flows over the VPN to headquarters, and Lifeline is experimenting with voice over IP (VoIP) on the VPN. Down the road, the company may consider installing IP voice servers that can distribute IP phone calls among any of the sites making it possible for any of the regional sites to function as call centers in an emergency, Reich says. Another potential benefit of VoIP is easier voice and data management because the network would be all-IP.

The company is already into storing voice digitally, using software from Verint. Specific calls' .wav files can be retrieved by searching on time and customer name, rather than searching through tapes.

If Lifeline decides to move toward VoIP, it would hire one service provider to handle all Internet connections. That way the company could negotiate more service-level agreements geared toward supporting high-quality voice, Rebello says. ■

HP

continued from page 19

Fujitsu-Softek, have implemented virtual tape systems in software.

The StorageWorks Extended Tape Library Architecture automates and verifies configurations, avoids network collisions that could disrupt backup, and detects and tracks SAN errors. In the future, HP says it will be able to decide which tape drive to archive data to, partition drives and determine whether data should be migrated to disk rather than tape. HP says it plans to include virtualization software capability, which aggregates multiple libraries into one virtual pool so data can be migrated and archived more easily. In the event of a drive failure, another tape drive could be substituted for the failed drive without the back-up application being aware.

"We see this setting the stage for information life-cycle management," says Rick Luttrall, director of near-line product marketing for HP's Network Storage division. "You are going to need to have attribute-based storage or hierarchical storage management where you store the things you need most quickly on disk and the data you may only need once a year on tape. It's still accessible regardless of where it sits in the hierarchy."

HP is not the first to take advantage of placing applications on tape controllers. ADIC, which introduced its Scalar i2000 library in March, also uses an intelligent controller to interface its box with Fibre Channel switches. Like HP's technology, this lets users migrate to faster Fibre Channel SANs without changing the individual tape drives in the array.

ADIC's Scalar i2000 integrates back-up management functions, including native partitioning of one library into multiple logical libraries, mixed media, Fibre Channel connectivity, performance monitoring, system health and readiness checks, diagnostics and policy-based user alerts.

Quantum-ATL's FC470 Fibre Channel router also monitors health information of the library and performs partitioning and serverless backup.

"The tape library has been the last place where vendors have innovated with respect to enabling the networking of tape products," says Peter Gerr, senior analyst at Enterprise Storage Group. "From a tactical standpoint it allows users to consider the tape aspects of their environments along with the disk solutions, which is a good thing for the management of tape."

The interface controller for HP's StorageWorks Extended Tape Library architecture costs $13,000. It also is incorporated into the HP ESL9000 Extended Library. The separate Interface Manager card is expected to be available next month for $2,000. ■

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Special Focus: VIDEOCONFERENCING

Simplicity key to videoconferencing success

■ BY JASON MESERVE

Videoconferencing technology is gaining popularity for specific applications such as distance learning, corporate communications and group meetings.

Schoolchildren in rural Oklahoma are taking virtual tours to the Baseball Hall of Fame in Cooperstown, N.Y., and the Mote Marine Laboratory in Sarasota, Fla. Bristol-Myers Squibb is conducting company-wide meetings at a savings of $14,000 per meeting. Consultants at Manhattan Associates are using videoconferencing to meet with multiple clients in one day with the added benefit of travel cost savings.

At the Howe Public Schools near the Arkansas border in southeastern Oklahoma, videoconferencing was brought in to help expand the curriculum in the district, but ended up having the opposite effect. "We wanted to bring classes in, but we ended up hiring teachers and do classes out now," says Lance Ford, technology coordinator for Howe and a neighboring district. Video is used to offer classes such as video production (taught by Ford) and Spanish to other area schools, with the remote school picking up part of the full-time teacher's salary. "Plus, we take our kids all over the country on virtual field trips."

Howe has about a dozen IP-based (H.323) videoconferencing units, ranging from a Polycom ViaVideo desktop device all the way up to a $30,000 Tandberg 6000 room system with big-screen plasma displays and document cameras. A 16-port Tandberg multi-point control unit (MCU) and eight-port Accord (now Polycom) bridge help connect the district to the outside world via the state's OneNet ISP, a 100M-bit network with four points of presence to the outside world and a Gigapop link to the Internet2 network. The district runs a Cisco-based LAN with video running separately from the data network, which helps simplify administration.

"I could have done priority packet routing with the Cisco [equipment], but I didn't want to question it," Ford says of creating two LANs. "I wanted to know the throughput on the video side and vice versa."

Ford says training is one key to success in getting dyed-in-the-wool teachers to use the newer technology as well as making it as transparent as possible.

"One thing we do in the distance-learning classrooms is use a locator mat, so when you step on it, the camera will focus on your location," Ford says. "Before, we had to focus the camera on the teacher's shirt or something, and it didn't work out as well."

To help simplify making a call, particularly to the outside world, Manhattan Associates, a supply-chain management systems consultancy in Atlanta, uses Polycom's MGC-50 gateway and Path Navigator software. "Before, users had to enter a

See Videoconferencing, page 22

Tips for successful videoconferencing

- **Plan ahead:** How will the technology be used and what network systems need to be in place to support it (i.e. addressing and QoS schemes)?
- **Know what you're buying:** What are the product's limitations? Do you have the latest software versions?
- **Beware of poor resellers/ consultants:** Those who promise the world can deliver systems more complex than needed, and hamper productivity.
- **End users:** Get them involved early in the testing and get feedback.
- **Just another tool:** Make the technology as transparent as possible so users feel like they're in a meeting and not on TV.

Short Takes

■ **BMC Software** has extended support for many versions of Linux to several of its systems and database management products. For example, BMC has added support for Red Hat's Enterprise Linux 2.1 and SuSE Linux's Linux Enterprise Server 8 to several of its products, including **Deployment Manager for Linux Version 1.2,** and its SmartDBA cross-platform database management tools. The new version of Deployment Manager lets administrators manage thousands of dissimilar Linux systems from a central location.

The tool supports in-house Linux applications and disk sharing for IBM's Virtual Memory operating system, BMC says. The company has expanded its product family for managing mixed database environments with the addition of performance-monitoring tools for Sybase and SQL Server databases. The SmartDBA products for Sybase and SQL Server and the Linux products are available now.

Keynote offers Web site mgmt. service

Company's Firefly offering aims to improve site performance.

■ BY DENISE DUBIE

Keynote next month plans to unveil a service the company says will help corporate customers monitor Web site response times and pinpoint the source of performance problems.

Keynote's Project Firefly is a customized Web management portal, or dashboard, from which Keynote customers can view measurements of Web site performance in real time. Keynote expects to begin beta-testing the service with customers in September.

The company maintains more than 100 points of presence in major metropolitan areas around the world and uses 1,500 computers to simulate and send real, end-user traffic to customer Web sites. The company measures how the Web site responds to high traffic volumes and hits from different geographic locations, and tracks how long a site takes to load content and images.

With this service, Keynote says it can relate performance measurements back to the network and systems that support them. The service also can identify whether an ISP is responsible for the performance issues. Customers using the Firefly service can perform diagnostics through the dashboard by clicking on highlighted problem areas (see graphic, page 22). The service will provide companies with a view of Web site metrics such as packet loss, availability based on location and network latency.

Jean-Pierre Garbani, a research director with Giga Research at Forrester, says the service could help enterprise network managers extend in-depth network and systems monitoring outside their corporate firewalls. Data collected by Keynote can be sent to management consoles from HP, IBM and Computer Associates, and Garbani says most large management vendors don't offer the external view of Web site performance on their own.

"The service provides operational performance indicators. It's not just measuring how successful a Web site is in marketing terms," he says. "Enterprises need to know how their site works from the outside, and Keynote is tying that performance back into infrastructure management."

Keynote, along with its competitor Gomez, made its start providing performance benchmarking services to corporations. With this and other recent service offerings, Keynote has delved deeper into troubleshooting, diagnosing and finding the cause of slowdowns and failures. Companies such as Mercury Interactive and BMC, with its recently released Patrol Express 3.0, also offer products and services that monitor performance from an end-user perspective.

Keynote hosts the measurement software and configures it to collect performance statistics from customer Web sites, and it correlates and analyzes the data. The data is then fed to a Web portal, which generates reports for customers.

To use Firefly, enterprise business and network managers can log on to their

See Keynote, page 22

'NET INSIDER
Scott Bradner

Is the allure of copper fading?

The U.S. is beginning to catch up with much of the rest of the developed world when it comes to the prevalence of mobile phones, but the rest of the world is not standing still.

Only a voyeur would look forward with any pleasure to the constant inescapable one-ended babble of people exposing their personal or business underwear in public. But I expect there's a group of businesses that look forward to that future with even more disquiet than I do, and those are the companies whose business plans depend on the continued value of buried and suspended copper.

Projections by In-Stat/MDR and Nokia, the Finnish handset maker, are that there will be between 1.6 billion and 2 billion cell phones in use within the next five years. That's a lot of interrupted concerts, meals and meetings!

The International Telecommunication Union estimates that more than 40% of the phones in the U.S. are cell phones. This is far lower than in some other countries but impressive considering the relative high cost of cell phone service in the U.S.

But, as noted by *Network World* columnist Keith Shaw in June (www.nwfusion.com, DocFinder: 7232), almost half of U.S. phone users would drop their dependence on their landline phones and switch entirely to the cell phone if the price was right. According to CNN, 7.5 million people have already gone cell-only and the number of landline phones in the U.S. has dropped by more than 5 million in the past three years.

For people considering going wireless there are some things to consider. For one, cellular coverage can be spotty.

But the most important difference, other than mobility, between landline phones and cellular service is that enhanced 911 (e911) currently does not work with cell phones. So if you call in time of emergency, the rescue folks will not be able to find you unless you are calm enough to know where you are and can tell them. This deficiency is expected be fixed over the next few years, and might be fixed in some places already, but unless you plan to never get into trouble, keep this in mind.

There is something else that another party to this situation must keep in mind. Phone companies have billions of dollars worth of copper wire in the ground and on poles. The primary purpose of these wires is now eroding and eroding the revenue of those phone companies that do not have a significant cellular infrastructure. So far the erosion isn't significant, but the handwriting is on the wall.

The phone companies can provide Internet and video services through their lines, but losing the voice business is going to have a very negative effect on their financial health. You and I might not cry over this (their employees will), but I fear that the FCC might try to "help" them at our expense — and beware the helping hand of regulators.

Disclaimer: Some are fearful of Harvard's "help," but it did not help with this column.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sob.com.

Videoconferencing

continued from page 21

[special] key to get the ISDN call to work, now that they're going through the bridge, and just dial the phone number on the other end," says Chip Owens, senior telecommunications analyst with the company. "There's no features or codes that a user has to painstakingly figure out."

Videoconferencing helps connect Manhattan's consultants with clients and lets senior executives around the globe have meetings without traveling. IP is used for video calls on the internal network with ISDN providing the connection to the outside world, says John Drummond, systems operations manager.

Before rolling out any technology, Manhattan makes sure all features, software versions and network connections work as advertised. Potential videoconferencing customers should be wary of integrators that sell you the world but might not have your best interests in mind. Drummond and Owen ended up getting rid of an integrator that did not meet expectations.

"A lot of integrators do a disservice to the industry," says Phil Go, CIO of Barton Malow, a design and construction firm in Southfield, Mich. "They try to package, customize and do a lot of ad hoc things that don't add much value to the unit. It really takes away from the unit and makes it more complex."

Go, who manages three Polycom group systems used mainly for internal communications among Barton Malow's offices around the country, says customers should get to know integrators and vendors well before making a purchase.

For the Energy Sciences Network (ESNet), the ISP run by Lawrence Berkeley Labs (LBL) under contract from the U.S. Department of Energy, planning and working with vendors on integration are big keys to success for managing a network with more than 1,000 registered endpoints and supported by one full-time employee and a part-timer.

While the network has plenty of bandwidth — it has OC-192 and OC-48 links making up its backbone — figuring out an easy way to manage every registered user is a challenge, says Mike Pihlman, H.323 project lead at LBL and the one full-time employee dedicated to the videoconferencing piece of ESNet.

Pihlman worked with commercial vendors such as Radvision, Latitude and FVC to implement a group of scheduling and reservation systems where needed and making the modifications necessary to work in the ESNet environment. For instance, with most scheduled video calls running through an MCU, the MCU dials out to each participant to set up the call. But Pihlman's users didn't like the idea and wanted to be able to call into a conference at their leisure. Pihlman worked with his vendors to make the necessary changes to support his users' wishes.

User feedback can be imperative to any application implementation, and videoconferencing is no exception. When the pilot group at Manhattan Associates was asked what could be done to make conferencing better, one test member replied, "When we call into the bridge, can you have Cartman [a brash-talking character from Comedy Central's animated series 'South Park'] handle the voice prompts?"

How much involvement there is in supporting a video call from the technical side can depend on the type of meeting taking place. For smaller meetings, an easy-to-dial system that does not require technical support might be more appropriate.

At Manhattan, a relatively hands-off approach is more important, where use of the main videoconferencing unit in the Atlanta office, one of 14 in the whole company, peaks at 180 calls per month.

"Spread that [usage] through the year, and half of the calls would save someone airfare to somewhere," Drummond says. "That's big money that adds up."

On the opposite end of the spectrum, in Bristol-Myers Squibb's executive briefings that encompass from five to 80 sites around the globe and can include hundreds of employees, high touch is the name of the game. "We're marrying traditional video production with other technologies," says David Dougherty, supervisor of technical production.

Bristol-Myers Squibb spent approximately $14,000 on video production services for each event before bringing the task in-house. Now Dougherty says the company saves about $346,000 in production costs annually. ■

Keynote

continued from page 21

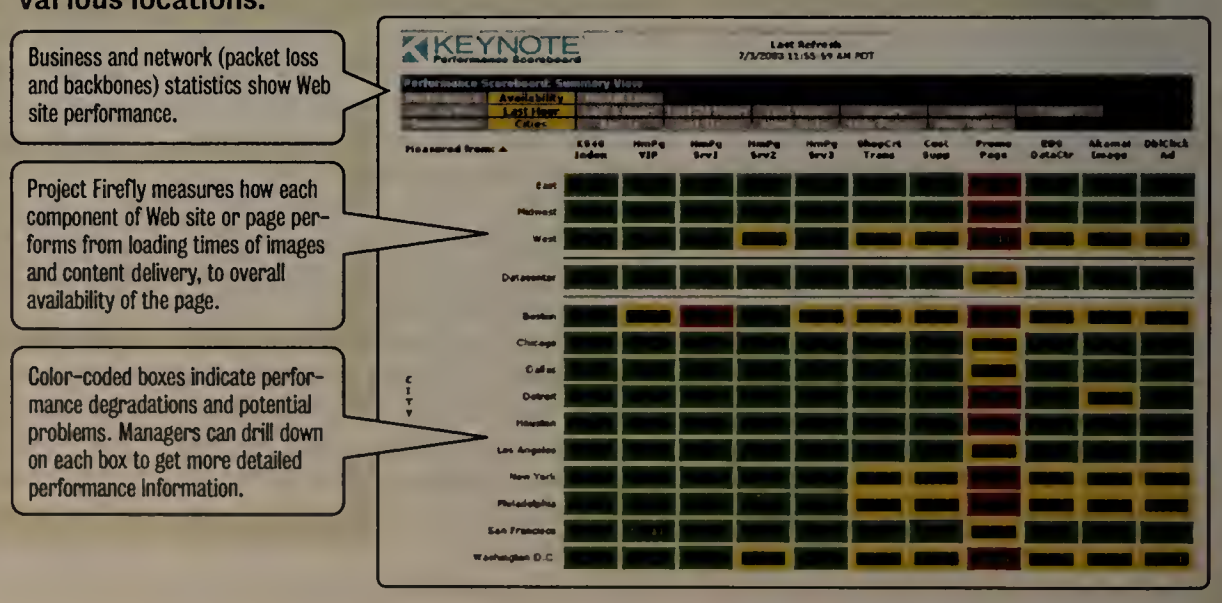
specified Web site (provided by Keynote) from their desktop with a user ID and password. A set-up wizard helps customers design reports that will show them the parameters they want to measure and set performance thresholds.

For example, a user could monitor the performance of his company's Web site from specific cities. And a network operations user could track packet loss and image loading time for specific applications and images on the Web site.

Keynote has yet to finalize the pricing but says customers could pay as much as $10,000 for the initial setup and $5,000 per month for the service. ■

Keeping score

Keynote's latest service, code-named Project Firefly, will let business and network managers see how their Web site, and all its components, respond to hits from various locations.



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Short Takes

■ Broadband provider **New Edge Networks** will wholesale DSL service from **DSL.net,** letting New Edge offer service in the mid-Atlantic and Northeast regions. This agreement augments the 600 switching offices from which New Edge can support DSL with 500 offices supported by DSL.net. In addition to Internet access via DSL, New Edge sells frame relay service over DSL, a less-expensive alternative for frame customers that need between a 56K-bit/sec link and a T-1 (1.544M bit/sec) frame connection.

■ **Equant** is making a push to grab hosting company and managed service provider customers that might be in financial trouble. Called **Server Migration Program,** the effort promises to evaluate customers' needs and propose Equant services to replace those provided by its competitors. Equant, whose network reaches into more than 150 countries, says it will focus the program on companies with sites in many countries. Equant offers managed servers, security and messaging, and a range of consulting.

■ **Sorrento Networks** last week closed the acquisition of optical-access vendor **LuxN.** Sorrento had announced its plan to acquire LuxN in June. LuxN supplies optical-access equipment for the network edge using coarse and dense wavelength division multiplexing. Sorrento makes optical products for metropolitan/regional network applications. The LuxN acquisition adds about 20 customers to Sorrento's installed base.

■ **Sprint PCS** customers now can subscribe to a package of multimedia content delivered to their cell phones by **RealNetworks.** For $4.95 per month, subscribers get access to news and information from media services such as ABC News, CBS MarketWatch, Fox Sports, National Public Radio and The Weather Channel, in addition to entertainment services.

Nextel to offer Wi-Fi service

Carrier joining RadioFrame Networks to deliver fully managed private service.

■ BY DENISE PAPPALARDO

Nextel is teaming with RadioFrame Networks to offer a fully managed, in-building wireless LAN service.

The planned offering, Integrated iDEN/WLAN, lets business users establish not only a Wi-Fi network throughout their building or campus, but also lets them improve their Nextel service coverage in the same area.

While Nextel's competitors, including Sprint PCS and T-Mobile have been touting public Wi-Fi offerings, Nextel's first foray into Wi-Fi is focused exclusively on private network support.

T-Mobile probably has been one of the most active Wi-Fi supporters, having built out 2,300 public hot spots since last year. Sprint PCS more recently jumped into the Wi-Fi arena. Last month the company announced that it's building 2,100 public wireless hot spots to offer wireless service customers access to the Internet and their corporate networks while at airports, convention centers and hotels across the country.

"The Wi-Fi service market is still in its early stages," says Sarah Kim, an analyst at The Yankee Group. Nextel is approaching the market from a private-service approach, which might be better suited for its existing customer base, she says. Nextel has a significant number of users in the healthcare and construction markets, which both seem like logical markets for users of a WLAN service that also increases voice service support, Kim adds.

Nextel's private Wi-Fi service includes network consultation and design with representatives from Nextel's Custom Network Solutions division. Once the network design is established, Nextel deploys RadioFrame Units that connect directly to existing Category-5 LAN cabling, which many customers already have installed. This lets a customer leverage existing infrastructure while upgrading to a more flexible Wi-Fi network, says Ernie Cormier, vice president of business solutions at Nextel.

Standard wire-line LAN support also lets customers link Wi-Fi users to existing network servers and Internet access connectivity points.

The RadioFrame Units can support up to seven RadioBlades, which are transceivers in the form of fat cards, 4 inches long by 3 inches wide and about a half-inch thick. While RadioFrame offers several types of RadioBlades, including those that support 3G wireless technologies such as GSM, Nextel is deploying 802.11b and iDEN wireless network transceiver RadioBlades.

The RadioFrame Units act as Wi-Fi access points to the user's private WLAN network and an access point to Nextel's public wireless network. Nextel's national mobile wireless network is based on Motorola's iDEN technology.

See Nextel, page 25

Wi-Fi from Nextel

Nextel's iDEN/WLAN service lets business users set up an in-building wireless LAN that's fully managed by the carrier. The service price is based on:

- Nextel voice and data service packages the users adopt.
- Handheld devices deployed to employees.
- Number of RadioFrame WLAN devices deployed throughout the network.
- Wireless PBX support.
- Network maintenance, monitoring and upgrade packages.
- Network design, installation and consulting.
- Wireless data applications supported, such as fleet and inventory management.

Savvis touts voice mgmt. services

■ BY DENISE PAPPALARDO

Savvis Communications is expected to announce a wide-ranging partnership with AccessLine Communications this week that will result in a suite of new hosted voice services for customers and increased traffic over the Savvis backbone.

The service provider is teaming with AccessLine to offer its suite of Voice Application Services to Savvis' managed service business customers. The services let users migrate the headache of managing a voice network off-site while also upgrading to a voice-over-IP environment that promises more flexibility, according to company executives.

The offering includes hosted Switched 800 Service, Conferencing Service, Mobility Teleworking, Disaster Recovery, Auto-attendant and IP Voice VPN.

"We wanted to offer our customers voice services, but the current trend of teaming with a hardware vendor didn't make sense," says Rob McCormick, CEO at Savvis. With these services, users can upgrade to new services without the cost of deploying new equipment, he says.

The services are hosted off-site on gear developed by AccessLine and accessed either through the traditional public switched telephone network or, more likely with most new customers, over Savvis' IP backbone.

Hosted IP voice services are growing in popularity. This year, users are expected to spend $281 million on these services, according to IDC, and by 2007 that figure is expected to jump up to $2.8 billion, the firm predicts.

Savvis is setting up a "peer" between its network and AccessLine's network infrastructure so new Savvis customers will have direct access to AccessLine's hosting environment.

AccessLine plans to migrate all its hosting gear into Savvis facilities, McCormick says. While there is not a specific timetable as to when the cutover will be complete, McCormick says he expects the transition to take about six months.

The migration lets AccessLine transfer its existing customers an IP network, while also partnering with a service provider that's focused on high-quality managed

See Savvis, page 25

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EYE ON THE CARRIERS

Johna Till Johnson

SSL: The next-generation VPN

A big part of my job is translating between IT professionals, vendors and venture capitalists. It isn't as easy as it sounds because they often use the same words to mean different things.

Take the concept of competition. To vendors, service provide and venture capitalists, a "competitive" product very often is one that looks, smells and feels a lot like yours — it relies on the same fundamental technologies to solve the same sets of problems. Under this definition, Sprint and AT&T compete with each other, and Cisco and Juniper compete with each other, but you wouldn't say that, for example, Cisco competes with AT&T.

IT professionals generally use a different definition. To them, "competitive" products are different approaches to doing the thing you need done. For example, if you're trying to get more bandwidth to a remote office, you might look into broadband services. You also might consider buying a router with compression or prioritization abilities that can help you do more with less. Under this definition, Cisco and AT&T do compete, because your choice is between buying a Cisco box and more bandwidth from AT&T.

Most recently, I've run up against this odd dichotomy of perspective when it comes to SSL vs. IPSec. Several vendors of IPSec and SSL VPN products and solutions insist that their offerings "don't compete" with the other guys. "Oh, we're IPSec, they're SSL," the CEO of one such company sniffed at me. "They're very different technologies."

True: SSL and IPSec are different. Or as we techies like to say, they're orthogonal.

SSL defines a secure, encrypted communications mechanism between applications, most commonly between a Web browser and server. It's independent of the underlying protocols (particularly IP). IPSec provides a secure, encrypted communications mechanism at the IP layer. It's independent of the application, meaning that any application that uses IP can run across it.

However, both schemes solve the same fundamental business problem: managing and controlling third-party access to your network, applications and resources.

So I'm with the IT professionals on this one. IPSec and SSL do compete. More to the point, SSL is gaining real traction as a VPN service offering. For example, Fiberlink Communications, a managed services provider, is partnering with Neoteris, a manufacturer of SSL-based VPNs, to let Fiberlink set up and manage policy-based VPNs for companies and their third-party partners, contractors and suppliers. And Aventail and Bell Canada just signed a similar deal.

Why are SSL-based VPNs gaining momentum? Because unlike IPSec, SSL doesn't require changes to the remote machine or network. Users don't need to install or configure special-purpose client software, making it easier to configure and manage VPNs. The drawback is that SSL is defined for a relatively narrow set of applications.

Increasingly, though, corporations are "Webifying" their legacy apps — or even jumping whole hog into Web Services — which makes SSL increasingly attractive. So I'm confident the trend of SSL-based VPN services only will continue.

Johnson is president and chief research officer at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com.

Savvis

continued from page 23

services, says Doug Johnson, CEO at AccessLine.

Johnson says the company plans to move most of its customers, but some will remain on AccessLine's legacy network.

AccessLine offers hosted voice services to 100,000 customer, including American Express, IBM and Sun. The majority of the company's customers still are running most of their services over traditional TDM voice networks, but many are moving toward IP, which is where Savvis fits in, Johnson says.

Savvis operates a national IP network that runs over ATM. The service provider has 2,000 managed service customers that will be able to upgrade any of their existing services to support Savvis' new voice offerings using their existing network connectivity. ■

Nextel

continued from page 23

"These customer iDEN networks become an extension of Nextel's macro network," Cormier says. Any Nextel mobile user entering an Integrated iDEN/WLAN building or campus actually might be accessing the wireless carrier's public network through a RadioFrame Unit.

The idea is to let users increase their Nextel coverage throughout their campus to support more reliable service, Cormier says.

Nextel's Custom Network Solutions division sets up and manages these WLAN networks for customers. Cormier says Nextel decided to work with RadioFrame because the company's products let users easily upgrade to the latest 802.11 standards as they emerge. Upgrading to 802.11g, for example, is as easy as pulling out an 802.11b RadioBlade and replacing it with an 802.11g RadioBlade, he says. "This allows users to future-proof their networks," he says.

RadioFrame is the first 802.11 vendor with which Nextel has teamed. While it is focusing on private Wi-Fi network support initially, Comier says the company has not ruled out public Wi-Fi service support in the future. The carrier would not elaborate on public Wi-Fi service plans.

Nextel says it has pilot customers testing the service today. The carrier expects the service will be available by the end of September, but it's looking at a "controlled introduction," Cormier says. "We aren't looking to sign up 100 customers as soon as we launch."

Because most of the networks are customized, Cormier says it's difficult for Nextel to offer pricing information. But service cost is based on several factors, including the public voice and data service packages a user purchases, the number of RadioFrame Units deployed and the types of data applications supported. ■

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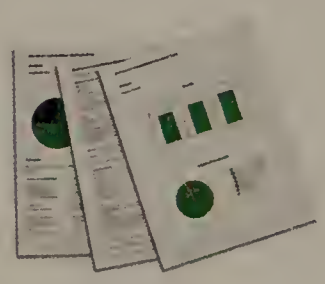

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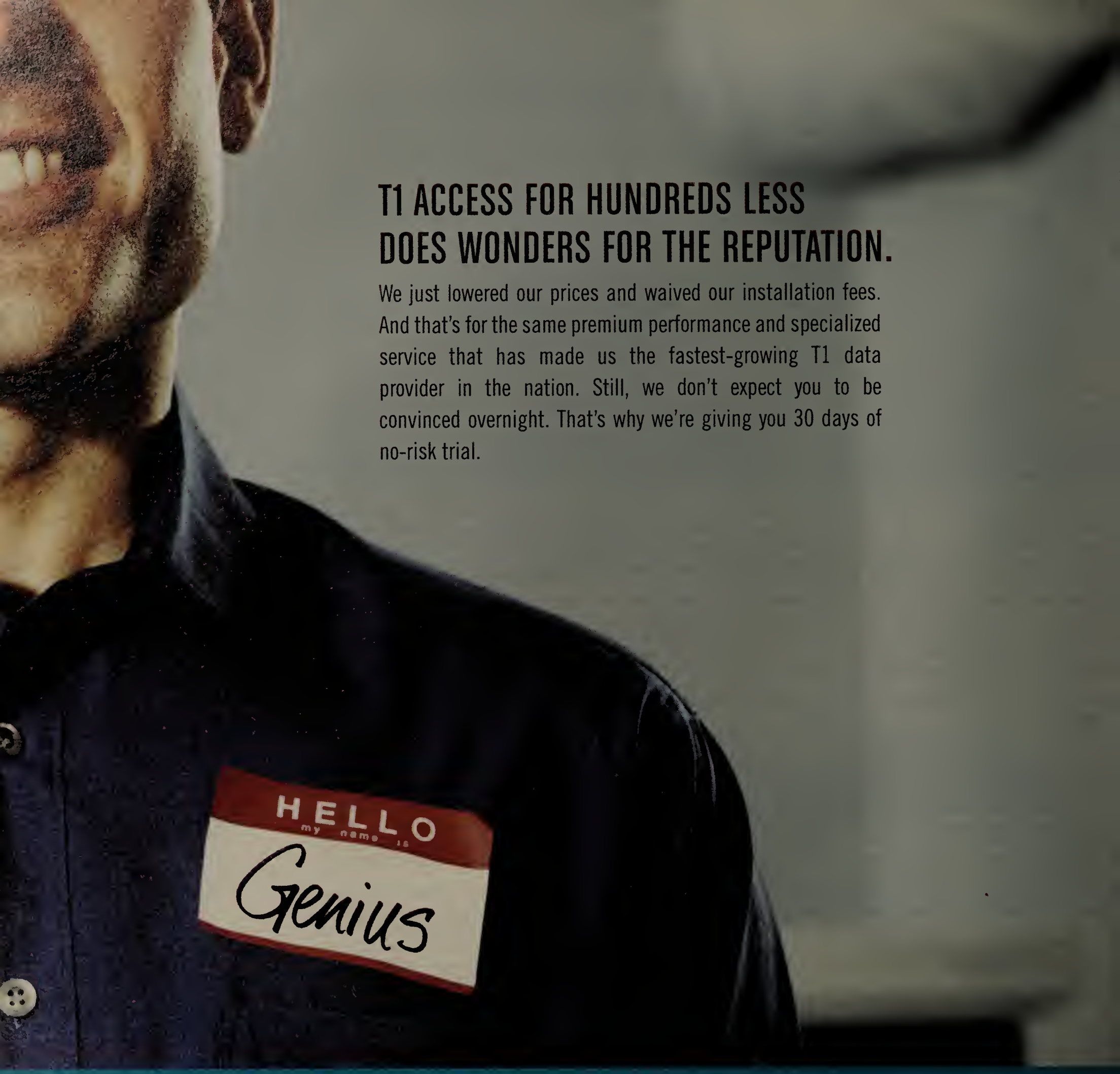

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10G

BIG BAD BANDWIDTH

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An editorial supplement to
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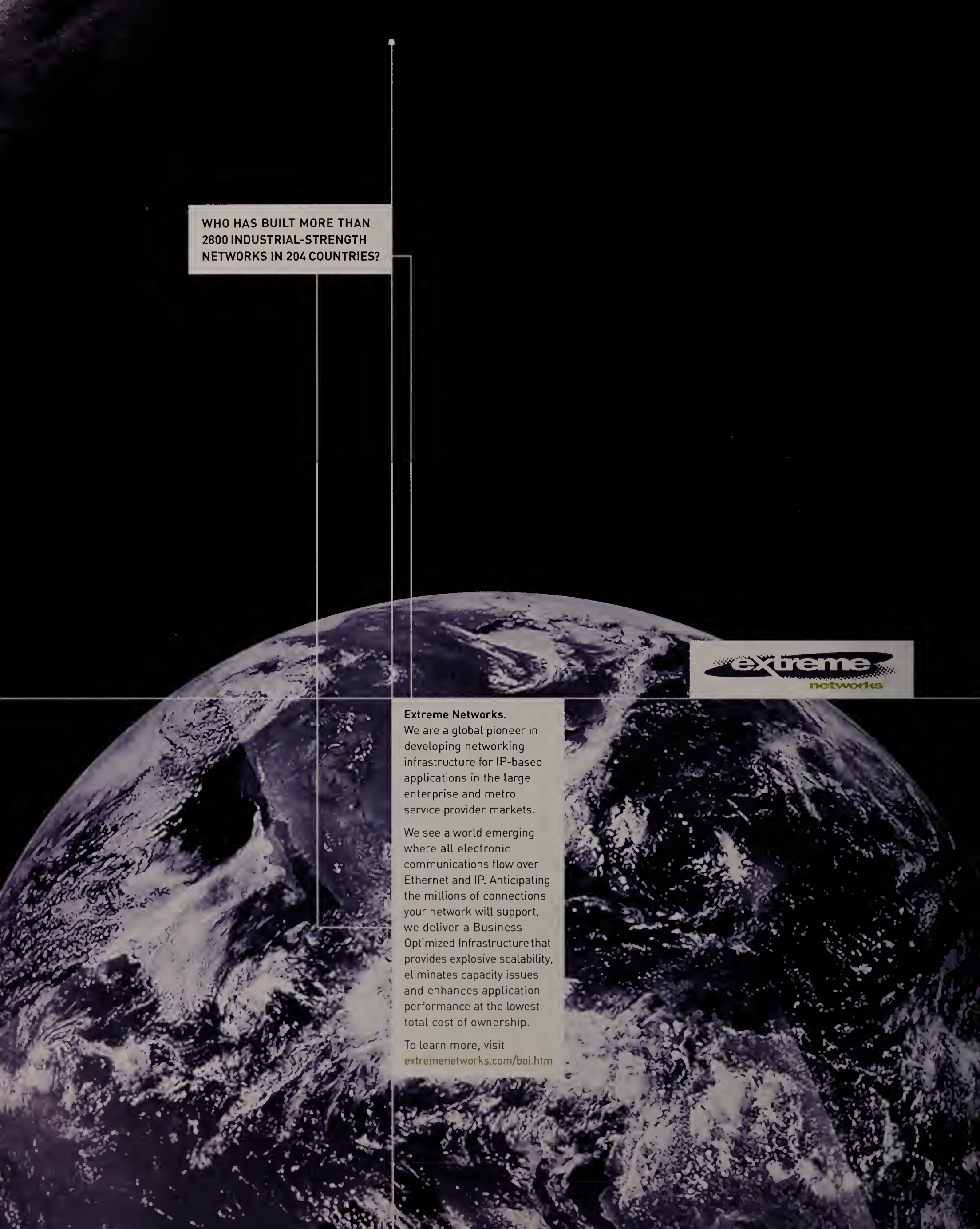

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Three organizations with very different requirements, but one thing in common: They needed 10G Ethernet, and they got it from Extreme Networks.

These organizations are far from alone. Extreme Networks is the leader in market share for Layer 3 10G Ethernet port shipments, according to market research firm Dell'Oro Group (reported for the quarter ended March 2003). Customers are finding Extreme Networks' BlackDiamond® switch provides a reliable, ultra-high bandwidth foundation for 10G Ethernet, enabling them to support advanced applications, including convergence of data with voice and video, high-speed storage and enterprise resource planning software.

"As more devices come on to customer networks, driving up traffic levels, the pressure to implement 10G is really starting to ramp up," says Ameet Dhillon, senior product manager for BlackDiamond with Extreme Networks. "At the same time, 10G per-port prices are coming down, particularly as we introduce XENPAK pluggable optics."

The Extreme Advantage

One of the reasons BlackDiamond is so adept at handling 10G Ethernet is Extreme's implementation of quality-of-service (QoS) features. QoS enables customers to differentiate among the various types of traffic flowing through their networks, giving preferential treatment to delay-sensitive traffic such as voice and video, for example. With many vendors' implementations, turning on QoS means taking a dramatic performance hit, but that is simply not the case with BlackDiamond. In fact, with QoS turned on, BlackDiamond handled Network Computing's "most rigorous tests" without dropping a single packet, earning an Editor's Choice award and the publication's annual Well-Connected award in the 10Gigabit Switch category.

Another Extreme differentiator is the fact that it uses the same ASIC technology and operating system across its three switch families: Summit, Alpine and BlackDiamond, which address edge, aggregation and core requirements, respectively. The approach dramatically simplifies network operations because once you learn how to use one platform, you know them all. That, in turn, reduces total cost of ownership (TCO).

A number of other standard Extreme features help reduce TCO, including the BlackDiamond's use of a centralized engine for providing Multi-Protocol Label Switching (MPLS). That enables any port connected to the switch to be instantly MPLS-enabled, including 10G Ethernet ports, at no extra cost. Similarly, for more than a year, all Extreme switches have been IPv6-enabled, an issue that federal government users and contractors are now following closely. "The Extreme approach provides future proofing, on top of cost savings," Dhillon says.

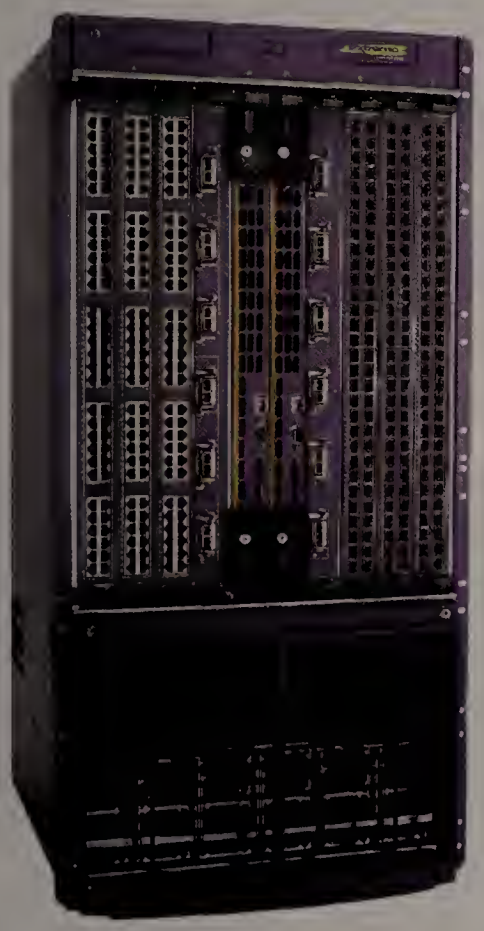
Building for the Future

To keep up with customer requirements, Extreme has announced plans to deliver a higher density 10G platform. Code-named Mariner and due out by the end of 2003, the switch will offer up to 48 10G Ethernet ports, 480 Gigabit Ethernet ports or a mix of the two–the highest density in the industry. BlackDiamond, with its 10G interface capability, will be complementary to Mariner, able to feed traffic to the high-density core switch.

Mariner will cross a new cost threshold with respect to 10G Ethernet, with per-port prices expected to be in the $8,000 range. With pricing for the BlackDiamond G16Xi Gigabit Ethernet module at about $1,300 per port, that means we are about to cross the point where the price per port for 10G is less than the cost of 10 ports of Gigabit Ethernet.

The price break comes at an opportune time for customers, who continue to add more traffic to their networks from all kinds of new sources. Various wireless devices are now attaching to corporate networks, ranging from the traditional, such as PDAs and laptops, to the not-so-traditional, such as RF tags that monitor the whereabouts of goods in a warehouse. Companies are also adding traffic from building management systems that collect data from heating systems, door locks, light switches and the like, as well as feeds from video surveillance cameras, all of which give new meaning to the term "convergence."

At the same time, most servers and many desktops and laptops now ship with Gigabit Ethernet support built-in. As the number of users with these computer systems reaches critical mass, users will demand Gigabit Ethernet connections to their desktops, a move that promises to boost performance significantly. In a recent test, Competitive Systems Analysis, Inc., a consulting firm in Wellington, Fla., found that ordinary office applications increased in performance between 35% and 40% when run over Gigabit Ethernet instead of Fast Ethernet, while database transactions saw a 30% to 47% performance boost. Higher speeds at the edge will mean greater bandwidth demands in the core–and 10G Ethernet is the answer.



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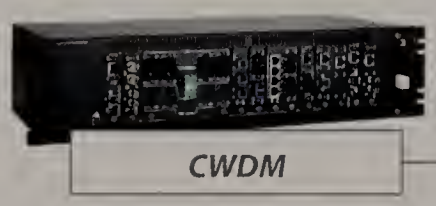

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10G MATURES

A network engineer assesses the latest round of 10G switches from Avaya, Cisco, Extreme Networks, Foundry Networks and Force10 Networks.

BY ZACH FIERSTADT

From the inception of its conceptual framework in late 1999 to the standardization of IEEE 802.3ae in mid 2001, 10G Ethernet has been one of the most anticipated and exciting technologies on the internetworking scene. Besides boasting throughput 10 times that of the already-blazing Gigabit Ethernet, 10G finally gives Ethernet-based networks the ability to contend with the more-established WAN technologies such as packet over SONET and ATM over high-speed OC/synchronous transfer mode circuits.

To the chagrin of many a network engineer and architect, the first round of 10G products, released less than a year after standardization, proved to be subpar. Some gear barely reached half the throughput defined in the specification, while others suffered from high amounts of latency and jitter. Potential customers quickly adopted an air of weary criticism, making it clear they would wait for more-refined products before making major purchasing decisions.

The wait has been short. Round Two of 10G products are here; the line-up looks promising.

Vendors that did not have Round One offerings are delivering their first, more mature 10G gear, while others already in the market are releasing more-refined versions of their earlier units in hopes of improving benchmarks and winning demand for their products. Most vendors say they have worked out the kinks in throughput capacity, leaving most of the differentiation to features including quality of service (QoS), IEEE 802.3ad link aggregation and reprogrammable ASICs.

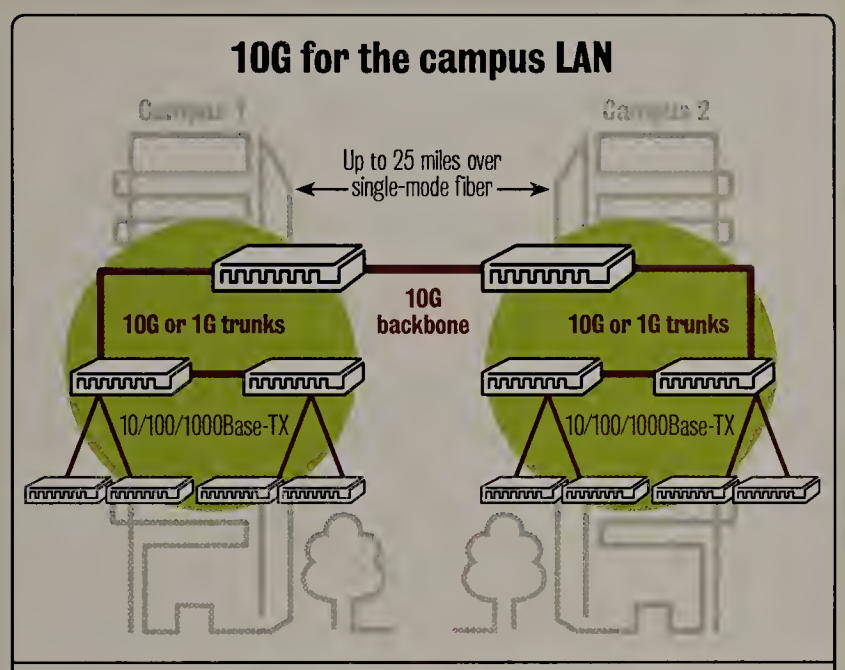
The improvements are coming none too soon for a growing number of enterprise network users who need to scale past 1G Ethernet. Their justifications for 10G devices include high-volume storage-area networks and back-up segments, IP telephony, Gigabit-backed main distribution facilities, enterprise metropolitan-area networks (MAN), points of presence interconnected via 1G trunks, real-time audio and video multicasting, and data centers with switching and routing cores leveraging many 1G trunks.

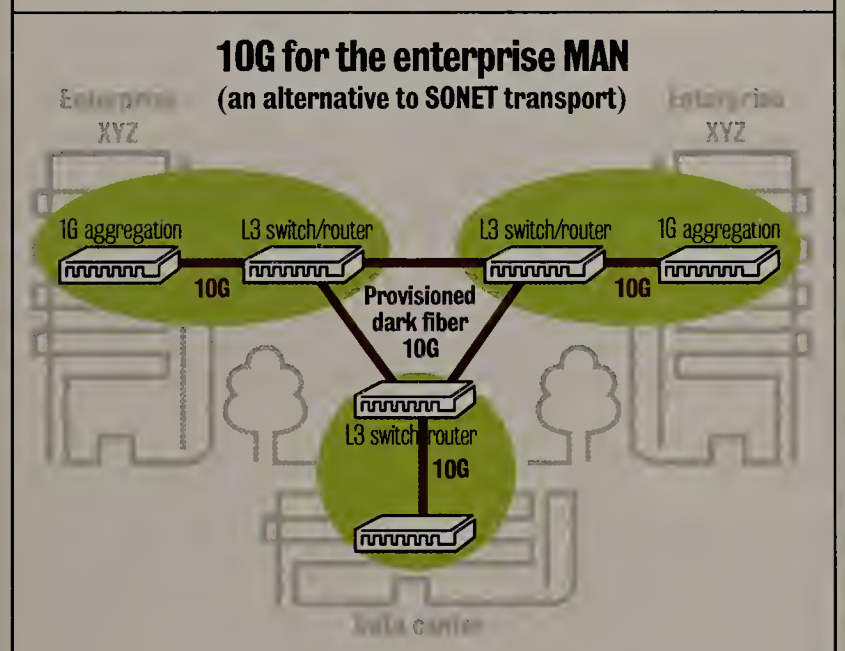
"I would use 10Gig for aggregation at the enterprise core, where multiple data centers aggregate via WAN backhauls to one central border network," says Chris Rogers, a lead network engineer at InfoSpace, a provider of wireless and Internet software and application services in Bellevue, Wash. "I'd also use it anywhere throughput, latency and jitter were major issues."

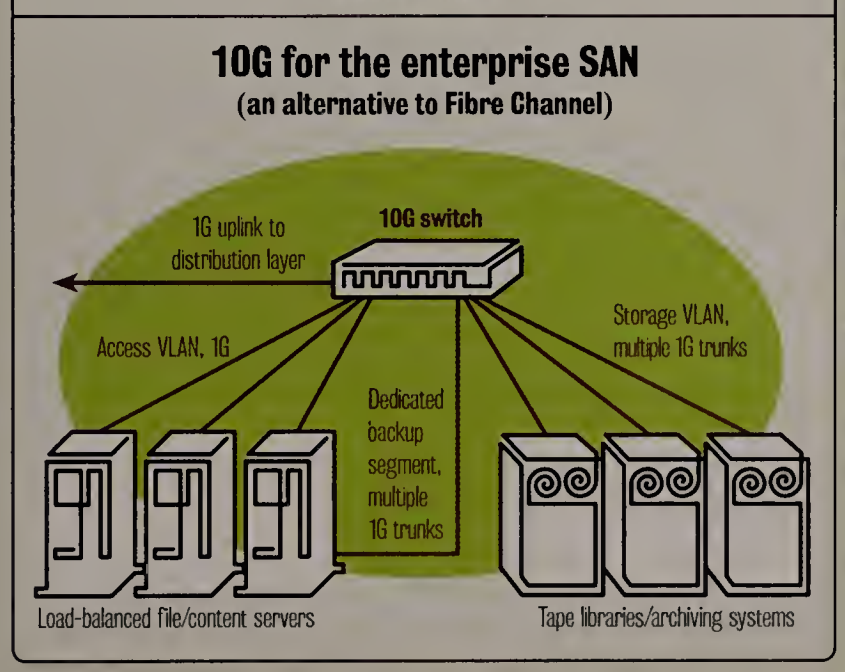
Likewise for 10G's use in a management or dedicated back-up network on which lots of data needs to move quickly, says Claude Johnson, Unix systems engineer for enterprise hosting firm Digex. "In a network of thousands of systems, during a limited back-up window, I want to move as much data to my back-up servers as quickly as possible and keep those very expensive processors busy," he says.

Now with production-quality 10G units at the ready, enterprise network managers must decide which vendor has the most cost-effective, scalable products and how this fast technology best fits into their networks.

Switch vendors will have to strike a balance between price, hardware density and software features to grab the attention of these users. Avaya, Cisco, Extreme Networks, Foundry Networks and newcomer Force10 Networks are representative of the renewed 10G efforts. They each rolled out initial 10G Ethernet switches in 2002 that *Network World* benchmarked earlier this year (www.nwfusion.com, DocFinder: 6627).







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an editorial supplement to NetworkWorld

INSIDE:

10G DECISION POINTS
At a minimum, you'll need to know the answers to these questions to make a sound decision on what 10G Ethernet vendor to embrace.
PAGE 56

10G MUSCLE
Following a limited 10G Ethernet deployment, Industrial Light & Magic plans a new, super-powered corporate network that will use a mind-boggling 200 10G interconnects.
PAGE 510

ONE BIG SUBNET
10G Ethernet holds endless possibilities for seamlessly extending enterprise networks into the MAN and across the WAN.
PAGE 513

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10G

10G DECISION POINTS

At a minimum, you'll need to know the answers to these questions to make a sound decision on what 10G Ethernet vendor to embrace.

- **What is the aggregate non-blocking throughput capacity of each 10G blade?**
- **What is the maximum forwarding rate for each 10G blade?**
- **Does the unit support wire-speed filtering and QoS?**
- **How well does the unit allow you to segregate production traffic from management traffic?**
- **What is the maximum number of 10G links per aggregated trunk?**

Avaya and the Cajuns

Avaya now has two units on its 10G menu: the Cajun-series P882 MultiService Switch, for carrier cores, and the P580, more suitable for companies with midrange to high-end computing needs. With a 55G-bit/sec backplane and a forwarding rate of 40 million packet/sec, the multilayer switch does not offer much competition in terms of performance. And while users should expect to see the Cajun-series switches priced less expensively than 10G units rolled out from more-established vendors such as Cisco and Foundry, the cost is still relatively high with respect to performance and density. This is especially the case when taking into account that Force10 offers line-rate 10G ports at half the cost.

The P580, which is supposed to have a 20% speed increase over the original P550, still harbors the cross-bar chassis design that inhibited its throughput levels when tested earlier this year. It will take new testing to know whether the upgraded chassis really has resolved congestion issues in the crossbar or the 8G-bit/sec cap on the switch fabric, as Avaya says. However, it seems doubtful considering that the only major difference appears to be a boost in CPU clock speed.

The P580's scaling attributes also are somewhat weak, with a maximum of eight 10G ports, 48 1G ports and 288 10/100M bit/sec ports.

But on more positive notes, the Cajun line offers a solid set of software features, most notably for QoS. And benchmark testing against traffic shaping and queuing features has been positive, with the Avaya code enforcing traffic classes and queuing policies with strict precision. The same goes for jitter and delay.

The Cajun P580 might not be the best choice for the corporation that's looking for high scalability and full 10G performance benefits at the core and distribution layers, but it could serve as a relatively cost-effective solution for firms looking to leverage wide-scale, QoS-enhanced voice-over-IP deployments and real-time videostreaming.

The Cisco Catalysts

Opposite to Avaya on the 10G performance gradient lies Cisco, which offers a promising line of 10G products for the distribution and core layers of an enterprise campus, MAN or WAN. The most noteworthy are the four-port WS-X6704-10GE and two-port WS-X6802-10GE modules, for the Catalyst 6500-series switches and the Cisco 7600-series routers. The 6500-series switch is probably a better fit than the 7600-series router for most companies with midrange to high-end computing needs because of the scalability (48 to 576 ports of 10M, 100M or 1G Ethernet), diversity and redundancy it can provide as one manageable unit.

Combined with the new Supervisor Engine 720, which allows for an integrated 720G-bit/sec backplane, the 6500 series can accommodate up to 32 10G ports. This gives it one of the highest 10G densities available. Most startling, however, is switching performance. When the 10G modules are upgraded with distributed forwarding cards and used in combination with the Supervisor Engine, it is possible to reach a sustained forwarding rate of 48M packet/sec per card and a sustained aggregate forwarding rate of 400M bit/sec.

The new 10G modules also offer myriad QoS and fault-tolerance features. While both modules have the traditional class-of-service-based selection criteria for setting traffic policies, the WS-X6704-10GE also supports virtual LAN queues for defining multiple policies on a per-VLAN basis. According to Cisco, the 6500-series platform, combined with the new 10G modules, should be able to trunk 10G links with 802.11ad link-aggregation. Failover times should be greatly improved via Spanning Tree Protocol enhancements such as Per VLAN Spanning Tree Plus and Resource Reservation Protocol, reducing the failover time gap between 10G and traditionally more resilient WAN links (traditional STP limits Ethernet path recalculation to a matter of seconds, while OC-48 and OC-192 can failover in a matter of nanoseconds).

Cisco's 10G products are competitive for core and data center deployments, but somewhat pricey. The Supervisor Engine 720 starts at $28,000 and the 10G modules range from $20,000 to $60,000. Enterprise users gain some flexibility, however, because the 6500's adaptive and flexible chassis design should let them add modules as needed.

Those Extreme BlackDiamonds

Extreme is delivering 10G with its BlackDiamond 6800 Series switches. The 10GLRi modules coupled with Extreme's Triumph ASIC technology result in an aggregate solution that could provide a fair amount of competition to Cisco and Foundry gear.

The BlackDiamond series includes the 6804, 6808 and 6816, which vary mainly by density and scalability options. While the 6816 offers only half the number of 10G ports (16) as Cisco's Catalyst 6500, it can deliver up to 1,440 100M/1G ports fully populated, providing more lower-end density than its competitors.

The BlackDiamond lower-end 6804 and 6808 switches max out at 256G and 384G bit/sec, respectively, making them less flexible than comparable competitive switches. But the 6816's 768G-bit/sec backplane is beefier than the Catalyst 6513's (the latest 6800 Series backplanes resolve the 8G-bit/sec cap of earlier models, allowing for full 10G throughput). However, the BlackDiamond's maximum forwarding rate of 192M packet/sec doesn't come close to that of Cisco or Foundry switches. This wouldn't be such a drawback if pricing was more competitive, with the 6816 base chassis costing more than the 6513's, and 10G modules at $29,000 per port.

To keep up with hardware-based access control list caching technology, BlackDiamond's feature set includes Triumph silicon technology that allows for wire-speed access control list (ACL) checking (reduces CPU overhead and filtering-related bottlenecks). It also does standard QoS traffic classifications and 802.11ad link-aggregation, allowing for 1G trunks.

While the BlackDiamond feature set is more competitive than most other vendor lines, the price vs. performance numbers hurt Extreme. Perhaps resolve might come from Mariner, expected to be released by year-end with six-port 10G blades at $8,000 apiece, and new silicon technology, dubbed "T-Flex," that will allow for updating ASICs with new configurations on the fly. With such pricing, Extreme will be a vendor to look to for customers on a tight budget with high-density requirements.

The Foundry for BigIron

Foundry says it has fixed the initial 8G limitation of the NetIron backbone routers and the BigIron Layer 3 switches with scorching throughput levels — 1.2 terabit/sec backplanes and forwarding rates of up to 480M packet/sec (second only to Force10), outrunning Cisco by 80M packet/sec. While the NetIron routers are attractive for the service provider edge, enterprise clients should look mainly at the BigIron switches for their 10G needs. The BigIron switches come in a staggered chassis line (MG8, 4000, 8000 and 15000) and the same backplane capacity and forwarding rate, allowing entry-level chassis options and modules that will scale as network aggregation and performance requirements increase. Foundry harbors up to 32 10G ports on the BigIron MG8 (comparable to the Cisco Catalyst 6513) at $14,000 to $20,000 per port.

Innovations trickle down throughout the BigIron platform, from the 20G-bit/sec dedicated management backplane (that isolates administration traffic from production traffic) and wire-speed QoS to software features such as Rapid Spanning Tree Protocol (RSTP), sFlow (comparable to NetFlow on Cisco), 802.3ad link aggregation and SNMPv3. Enterprise clients looking to deploy highly scalable, cost-effective 10G solutions should keep their eyes on Foundry.

A Force10 to be reckoned with

Despite its youth as a company, newcomer Force10 offers a 10G switch that outperforms Foundry's and Cisco's. Specializing strictly in 10G, Force10 offers two main products: the middle-end E600, with a 600G-bit/sec backplane and a forwarding rate of 250M packet/sec; and the high-end E1200. This flagship switch boasts throughput attributes that place it at the top of the performance list for high-end products. While its density is tapered slightly at a maximum of 28 10G (or 338 1G) ports, the E1200 will leverage a 1.2 terabit/sec switch fabric and an unprecedented forwarding rate of 500M packet/sec, allowing 48G-bit/sec throughput to each module (the Cisco, Extreme and Foundry switches cap out at 40G bit/sec per module) and wire-rate speeds on all ports, even with ACLs applied. Such performance numbers are enough to make any enterprise network engineer happy, especially when taking into account that Force10 has undercut the 10G market substantially, with pricing at $17,000 per port.

Force10's operating system, FTOS, should compete well, with a feature set including protocols leveraged on leading vendor products (RSTP, 802.3ad link aggregation, Virtual Router Redundancy Protocol). A variable to consider with Force10 is its freshness as a company: Code base maturity, product support and documentation take time to develop.

A matter of when

As the 10G arena unfolds, enterprise managers and network architects will have to take many things into consideration before making purchasing decisions. The wrong choice could make or break a network.

Fierstadt is a senior network engineer at eUniverse, an online entertainment and media network. He can be reached at lucid@switchninja.net.

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ADVERTISEMENT

Driving a New 10G standard

A conversation with Dan Dove, the HP ProCurve networking engineer who is spearheading the effort to ship 10G Ethernet over copper.

Dan Dove is chair of the IEEE 802.3ak Task Force, which is developing a standard for 10G Ethernet over copper. He is also principal engineer for LAN physical layers at HP–a self-described "Layer-1 kind of guy." We talked to Dove about the standard he's working on and where he sees 10G fitting in enterprise networks.

Where does HP want to go with 10G?

We're trying to drive the cost down so that 10G can be used more broadly. For example, as customers embrace Gigabit Ethernet to the edge of their networks, we will want a standards-based, cost-effective way to link switches together in the wiring closet. 10G over copper is a way for HP ProCurve to meet that need, along with the many others it already meets. That's why I've taken on the effort of chairing the task force and trying to drive a standardized solution into the market, called 10GBASE-CX4, which will support distances of up to 15 meters on copper. It's a short-haul interconnect solution.

HP's Dan Dove

[One of the] application spaces where I see 10G having a real big role is gigabit to the edge. Gigabit to the edge is going to happen because the technology has come to the point where it costs only slightly more than Fast Ethernet.

Why is the whole movement to 10G over copper important?

The initial 10G solution that's been available has been fiber optic and, unfortunately, it was initially expensive and continues to be, even with recent price reductions. It really violates a basic premise that the IEEE 802.3 Working Group has operated under for many years, which is 10 times the performance of previous generations for two to three times the cost. 10G optical solutions are about 10 to 20 times the cost, and while there are situations where that cost is justified, many customers use several gigabit links because it is so much more affordable. With the copper solution that we're standardizing, the cost will be more in that two to three times range. It will enable the short-haul interconnect of switches with 10G copper in the wiring closet, in data centers and small server clusters, including emerging iSCSI storage over Ethernet arrays. Optical solutions will continue to be required for longer distances, such as out to wiring closets, between buildings and in metropolitan area networks.

How soon will 10G-over-copper products be available?

The standard development is on track for ratification in December 2003, which is extremely fast considering we started last November. 10G copper products will follow in the spring of 2004.

What do you see as the high end in terms of distance over copper?

In November of last year, there was an IEEE study group formed to work on a longer distance copper for 10G, and they are talking about 100 meters. There is some question as to whether that's feasible and, if so, what media type would be required–whether it would have to be [Category] 7 or even something of a higher performance. The concept is to apply digital signal processing technology to perform very high levels of interference canceling or noise canceling. They're in the process of completing their project scope and requirements for IEEE approval. If approved, then they'll have a task force and they'll start developing a specification. I would guess it'll be somewhere on the order of two to three years before a spec comes out for that technology.

Where do you see 10G having the greatest effect in enterprise networks?

There are two application spaces where I see 10G having a real big role. One is gigabit to the edge. Gigabit to the edge is going to happen because the technology has come to the point where it costs only slightly more than fast Ethernet. PC manufacturers, including HP, are quickly moving to build in gigabit support on all desktop and notebook PCs. While there is a lot of benefit to gigabit to the edge without upgrading the backbone, as it becomes pervasive, we will need to, at least selectively, move to 10G uplinks and backbones.

The other side is storage. As iSCSI becomes more popular, 10G is going to provide higher performance for storage, remote mirroring functionality and things like that. Copper is a nice, low-cost way of implementing that in the data center and server/storage rooms.

HP Brings Intelligence to the Network Edge

The HP ProCurve Adaptive EDGE Architecture is all about creating a more intelligent network edge that can more efficiently and securely carry a broad range of applications on a LAN infrastructure. As customers add 10G Ethernet to their networks, the need for intelligence only becomes more important.

HP today offers a single-port optical 10G blade for the ProCurve Networking routing switch 9300m series and will soon deliver higher density 10G products. These include modular optical adapters that users can customize to best fit their needs, choosing from optical media that support 10G at distances ranging from 35 meters to 40 kilometers. By early next year, the choices will include 10G over copper, a technology HP is helping drive through the standards process.

In each case, the HP ProCurve Adaptive EDGE Architecture will help users properly manage that bandwidth. The architecture enables customers to set prioritization at the network edge for a range of applications, including those that 10G will make more feasible, such as voice, video, storage, Remote Direct Memory Access (RDMA) over Ethernet for creating server clusters over Ethernet and even grid computing. The HP ProCurve Adaptive EDGE Architecture also ensures that security is maintained throughout the network by controlling who gets access to what resources on a per-port basis.

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10G MUSCLE

After a limited 10G Ethernet deployment, Industrial Light & Magic plans a new, super-powered corporate network that will use a mind-boggling 200 10G interconnects.

In this summer's box-office attraction "The Hulk," mild-mannered scientist Bruce Banner morphs from an ordinary guy into a phosphorescent green, bulging super power — part hero, part monster who makes moviegoers cower in their seats. Terrified viewers have the visual-effects experts at Industrial Light & Magic to thank for their racing pulses. And just as Banner has been supercharged with gamma radiation, those ILM artists have been empowered with a hulked-up network.

See ILM, page S12

BY BETH SCHULTZ

Handling 96 terabytes of data was all in a day's work when Industrial Light & Magic artists were rendering images for "The Hulk" and two other summer movies, says Raleigh Mann, director of network operations for the post-production company.

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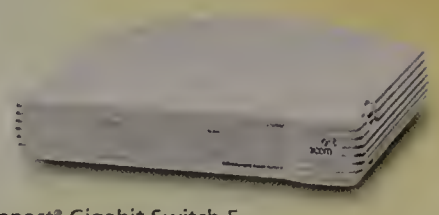

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ILM
continued from page S10

In March, ILM brought two 10G Ethernet modules — for its Foundry Networks BigIron Layer 3 backbone switches — into its already bandwidth-intensive enterprise network architecture. A Foundry shop since 1999, ILM uses seven BigIron switches (five 8000s, one 4000 and one 15000), about 40 FastIron II — plus a handful of FastIron II+ — closet switches, and more than 80 FastIron 4802 stackable switches, says Raleigh Mann, manager of network operations at the San Rafael, Calif., post-production company.

No time for massaging data

The BigIron modules are linked via a 10G trunk, with throughput speed of 8G bit/sec because of limitations of Foundry's current architecture, Mann says. (Foundry addresses the throughput limitations in the BigIron MG8, a terabit switching and routing platform introduced in April.) This 10G trunk serves as the conduit from ILM's production network, on which sits all of the artists' render processors and file servers, and the data center. Previously, Mann handled the bulkiest of data transfers by trunking together multiple 1G BigIron ports.

Of course, ILM artists know little of 10G or any other network technology. All they know is that they can create ever-bigger data sets that move swiftly across the network. They demand nothing less, Mann says.

"Every 18 months, our work follows Moore's Law. As computers get cheaper, disk space gets cheaper and our productions can move faster," he says. To make The Hulk and other movie creations realistic, ILM artists pour on complex textures in increasingly dense simulations. "More horsepower doesn't mean we can just work faster; it means our work can get more complex. Fabric, hair, water, flame, smoke, sand — we can basically simulate more particles and render a much more complex 3-D image," he says, emphasizing that the network has to keep up. "Our artists know the slightest difference in network performance."

Before implementing the 10G routers, available bandwidth for any particular data flow topped out at the 4G bit/sec Mann achieved by trunking the 1G ports. That data is primarily Network File System (NFS) traffic moving back and forth between Linux file servers and client desktops. ILM carries the NFS traffic using User Datagram Protocol (UDP) rather than the more feature-rich, and resilient, TCP. "We don't have the benefits of TCP for [flow-control] features such as backoff and sliding window ... but we decided the best way to get performance out of the network is by using UDP," Mann says. "We don't have the luxury of dropping packets. In our industry, with our turnaround time, we don't have the time to be figuring out problems or massaging data through the network."

Mann's mind is eased considerably with 10G. "What I don't have to think about anymore is whether any particular traffic flow that exceeds a gigabit is split up across cards. I can't quantify a performance improvement with the 10G, but it does make monitoring the traffic between the data center and the production network a lot easier," he says. "Having a single interface to watch for traffic flow rather than looking at four different interfaces and adding it all up makes it a lot easier to get a real-time feel and a quick snapshot of what's going on."

10G at the core

Mann expects his current network architecture, including the one 10G link, to see ILM through 2004. The network becomes obsolete after that, coincident with the planned June 2005 move of ILM headquarters from San Rafael to the Presidio, a former military complex in San Francisco. The move gives Mann his third opportunity to build a new network for ILM.

Mann is well into a design for the new Presidio network, and he knows 10G will play the starring role. Having used the 10G-infused BigIrons as proof of concept, he determined that the technology is stable and that performance is on par with expectations. "The look and feel is still Ethernet. We've had no disappointments or issues with the migration," he adds.

The Presidio network he envisions, and has begun talking to vendors about, will deliver 1G-bit/sec connections to 3,800 or so user machines, using multiple 10G links between each switching closet and a "very large mesh of 10G at the core for redundancy and performance," Mann says. He anticipates close to 200 10G interconnects on the network.

As if that's not mind-boggling enough, Mann says 40G is within reason, too. "I definitely see 40G within the core and to some of the higher-density closets," he explains. "We're looking at over a terabit capacity of core aggregate bandwidth potentially. Our data sets will just keep getting bigger as people continue to expect more realistic images."

Mann proudly notes this watermark: In May, network traffic hit 96 terabytes per day as artists cranked out the visual effects for "The Hulk" and two other summer hits — "Terminator 3" and "Pirates of the Caribbean." He has no doubt that this volume will more than double in the next 18 months, as ILM artists crank out the visual effects for "Star Wars Episode III," due out in theaters in May 2005.

The ILM environment is a bit bizarre, says Mann, who joined the company a little more than five years ago from AOL. Comparing the amount of data carried on it — a single company's network — to that carried on the largest ISP's network, he says, "To be on parallel with that much data in such a dense environment is very strange."

The best of times

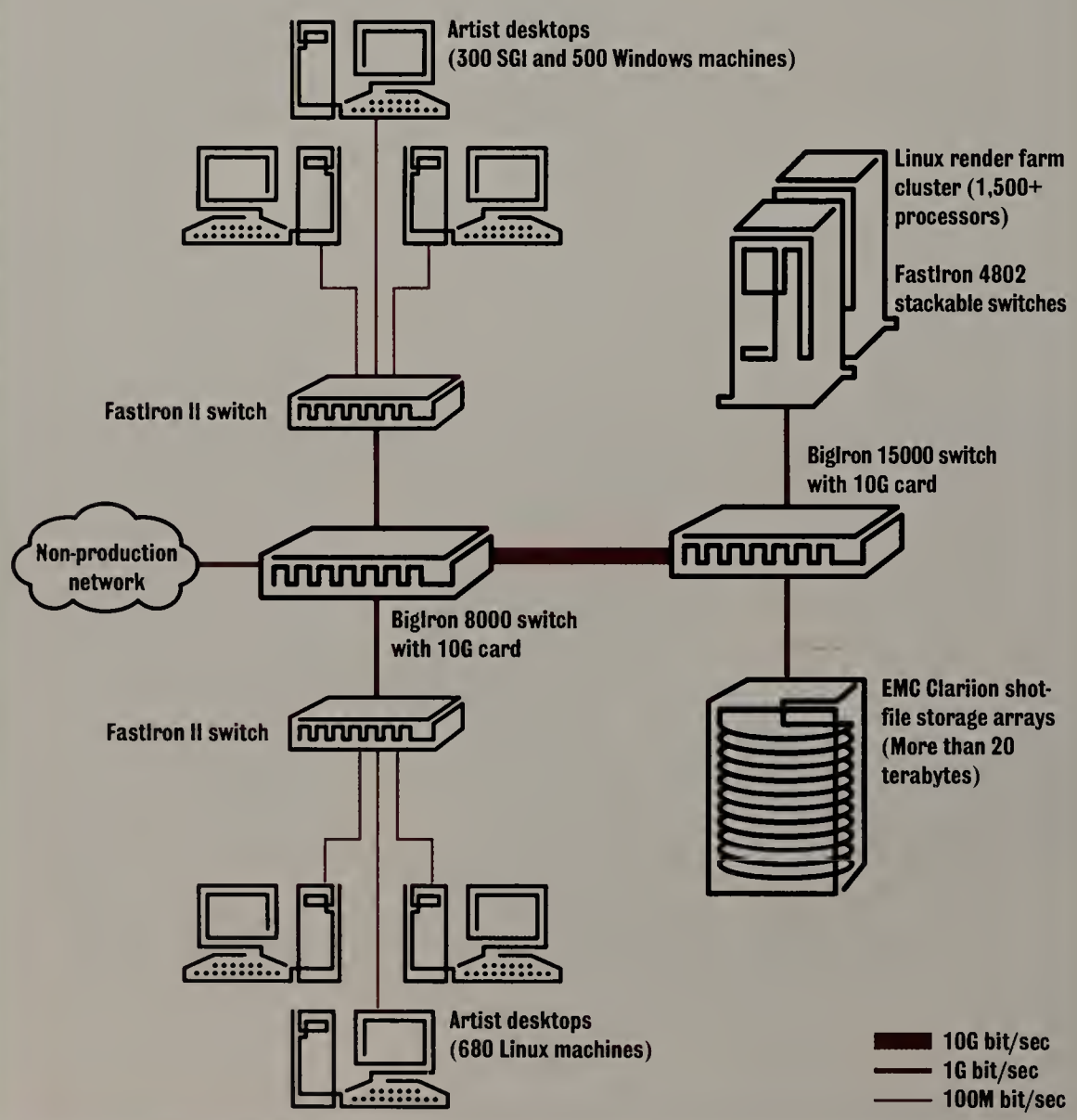
ILM will begin building the Presidio network and occupying the new data center in January 2005. That means ILM will need to buy the network gear before this time next year.

While Mann could not share budget info, he noted that he anticipates spending "a whole lot of money" on the 10G architecture planned for the Presidio site. "We already invited the players to play, and certainly price will be one of the deciding factors on who wins," as it was when it came down to choosing his 1G vendor, Mann says. Cisco had been in contention for that network, but lost out because Foundry Networks delivered four times the throughput at approximately half the price, he says.

Meanwhile, Mann is having a great time designing this next-generation network. He calls the task "daunting but fascinating," adding: "We're all having fun just conceptualizing this." ■

10G at the core

Industrial Light & Magic has boosted capacity on its Foundry Networks-based artist production network with a core 10G Ethernet link. Considered a proof-of-concept implementation, this 10G setup has convinced ILM to use more than 200 10G interconnections on a new corporate backbone it will build in 2005.



ONE BIG SUBNET

10G Ethernet holds endless possibilities for seamlessly extending enterprise networks into the MAN and across the WAN.

BY TERRY SWEENEY

What can an enterprise do with the equivalent of more than 6,000 T-1s worth of bandwidth? Just about anything.

Once 10G Ethernet becomes the backbone of choice for service providers, it opens the door to powerful possibilities. 10G Ethernet provides a natural handoff between corporate and carrier networks without the expense of encapsulation or conversion to SONET, frame relay or ATM. Terabytes could zip across networks like instant messages rather than the imperceptibly moving glaciers they often resemble. LAN, metropolitan-area network (MAN) and WAN connectivity would become one big subnet.

With 10G in the LAN, MAN and WAN, a car maker handling designs for multiple new models could handle backups and database synchronization among Detroit, Munich and Tokyo sites without downtime or waiting for one location's off-peak evening hours. Trillions of bits could traverse the globe easily, either as native Ethernet, packet over SONET or packet over wavelength division multiplex (WDM). Virtual LANs could come and go as fast as project phases were completed.

Suddenly, SANs would become as large as enterprise networks, server and database access would no longer be a function of geography, and surplus capacity could be shifted and exploited as needed. If one location suffers a natural disaster, all of its applications and data could be replicated at a different site within minutes.

End-to-end quality of service (QoS) would mean that executives' e-mail could be given priority over end-of-quarter sales numbers hogging most of the available bandwidth, regardless of user or server location. A LAN becomes a WAN, and a WAN becomes the world.

But this lofty vision will have to wait, as full 10G products are only now becoming available and services remain non-existent. The technology is pricey, and some technical shortcomings must be addressed before it scales to WAN thresholds.

Today, most 10G Ethernet ports come in blades for 1G switches. Because of this, throughput typically tops out at about 8G bit/sec. Carriers and equipment vendors point to 2004 as the real starting date for 10G Ethernet. That's when leading vendors such as Cisco, Extreme Networks, Foundry Networks and Nortel expect to have switches that perform at 10G bits/sec.

And next year will be when Gartner has forecasted that 10G volumes will begin to triple, year after year, going from 5,000 ports sold in 2001 to 185,000 in 2007 (see "Exponential Ethernet," page 11).

Escalating storage demands caused by HIPAA regulations has Hal Marietta, director of network services for Liberty Healthcare Group, eager for 10G Ethernet relief.

That's the same time frame in which carriers such as AT&T, Verizon and SBC will have 10G services ready. "I have a placeholder in my plan for next year to be able to fund some of the activity and tests," says Franco Collochio, Ethernet services product director for AT&T. "Late 2004 is our development time frame."

But early adopters, ranging from bandwidth-starved corporations to competitive local exchange carriers, aren't waiting.

"T-3 [45M bit/sec] was not enough bandwidth for us," says Hal Marietta, director of network services for Liberty Healthcare Group, in Port St. Lucie, Fla. "We decided to do more than 1G since we knew we wanted to do SAN replication at some point, without impacting the standard data flow."

Compliance with the new Health Insurance Portability and Accountability Act regulations, in their stringency regarding security and availability, is driving bandwidth demands, he says. To handle the 20 terabytes of data that Liberty Healthcare needs to be backed up every week, Marietta has been using Extreme's BlackDiamond switches at three sites. He has trunked together multiple 1G ports for the backup.

Exponential Ethernet

Gartner expects a steady increase in the number of 10G switches shipped as per-port prices come down, mimicking the pattern expected for 1G Ethernet.

	Ports shipped/Average price per port				
Ethernet switches	**2003**	**2004**	**2005**	**2006**	**2007**
100M	159 million/$46	164 million/$32	159 million/$23	153 million/$15	139 million/$11
1G	12 million/$443	21 million/$368	38 million/$250	53 million/$201	74 million/$148
10G	1,800/$29,000	5,000/$19,500	15,200/$14,360	51,800/$10,700	185,000/$7,710

The 10G mesh

Ethernet's established familiarity as the lingua franca of networks is propelling it into MANs and WANs. Ethernet has evolved from 10M to 100M to 1G and now 10G bit/sec in a little more than 25 years. The 802.3ae standard for 10G Ethernet, approved about a year ago, has a range of 25 miles, a far cry from the shorter hops required by its predecessors prone to signal fade. With a longer reach and a throughput that matches the OC-192 threshold of SONET and WDM backbones, 10G Ethernet becomes a means for corporate and carrier networks to mesh more seamlessly than ever.

That in turn creates the possibility of virtual networks — known variously as transparent LANs, VPNs or Ethernet subnets — on a scale previously unworkable. It leverages the 250 million Ethernet ports already in service and enables turbo applications such as grid computing using terabytes and petabytes of data, or SAN replication, with which backup and disaster recovery can occur in seconds. And QoS, largely absent from any switched Ethernet equation in which prioritization schemes differ among users and carriers, finally could be offered across WANs.

"A metro-area service would only give us the ability to have a site located farther away, but WAN-level could definitely help us," says Liberty's Marietta. "We'd have no bandwidth limitations, so it wouldn't matter where the server was. We can place resources where it makes the most sense."

That's the same line of reasoning used by network engineers at the Information Sciences Institute (ISI) at the University of Southern California in Los Angeles. "We look at 10G as an enabler," says Richard Nelson, director of computing at ISI, which has been using 10G Ethernet for more than a year.

Initially, ISI deployed the 10G to handle an increase in high-performance desktops and computing clusters. But USC decided that kind of speed made it possible to mirror the university's computing resources at ISI. USC has installed tape drives and other storage gear at the ISI location, 18 miles away from the main campus, so that if service or access to the campus is disrupted, it can bring the network back up from the data stored at ISI.

Using Foundry BigIron Gigabit Ethernet switches, ISI and the university are linked by a private 10G MAN that also connects to an Internet peering point in Southern California. From that location they tap into the TeraGrid network, a five-site, 40G grid-computing backbone that connects supercomputing and research centers across the country. "Whether it's an earthquake shake table or electron microscope data, we need the capacity for tera-scale research," Nelson says.

Nelson says he can foresee data center migrations and shipping tapes around for backup and restoration becoming passé. "Instead, you do a bulk transfer over a 10G network. People with terabytes of storage don't want to do it at 1G — they want 10G or faster," he says, adding that he's looking forward to actual 10G switches to avoid some of the complexity of trunking multiple 1G connections, especially because the lack of trunking standards preclude multivendor 10G networks.

Vendors needed time to perfect 10/100 Ethernet, and the same holds true for 10G, Nelson says. "As interface costs come down and availability of the right kind of fiber increases, 10G will become more normal in the corporate world. People will start to see the possibilities with remote backup or as a less-expensive alternative to [SONET] OC-192," he adds.

Paying the price

10G's potential is rich, but so is its price tag. Industry analysts place the price per port for 10G blades in the $30,000 to $40,000 range, but prices have gone as low as $10,000, according to Brian Strachman, senior analyst at In-Stat/MDR. In the first quarter of 2003, vendors shipped a total of 170 ports of 10G equipment. Contrast that with 734,000 ports of 1G Ethernet with an average cost of $518, and it's clear why 10G has yet to catch fire.

Adoption of a 10G Ethernet-over-cable standard, expected for completion by early 2004, should drive prices down and increase uptake of 10G, Strachman says. Gartner expects average port prices will fall from $19,500 in 2004 to about $7,710 by 2007.

Pricing for 10G services is a little trickier. Consider that Cybercon.com offers 1G services at $3,950 per month. This does not include local loop charges, which can range from $600 to $7,500 or more, depending on bandwidth size and distance from the carrier point of presence. Carriers won't likely charge 10 times as much for 10G services, but enterprise users can expect to pay at least double the prices of 1G Ethernet. AT&T, Verizon and SBC all say it is too early to discuss pricing.

10G has some other drawbacks. Critics like to point out that 10G Ethernet is not as resilient as SONET, and most companies are not going to tolerate a best-effort WAN service. Most carriers are looking at Multi-protocol Label Switching or the Martini specification for handling packet over SONET to make Ethernet behave more like SONET. How carriers manage those techniques as they scale up on the WAN remains to be seen.

As with any other service, enterprise users should be sure to negotiate a service-level agreement that establishes minimum-performance thresholds and compensation for any glitches.

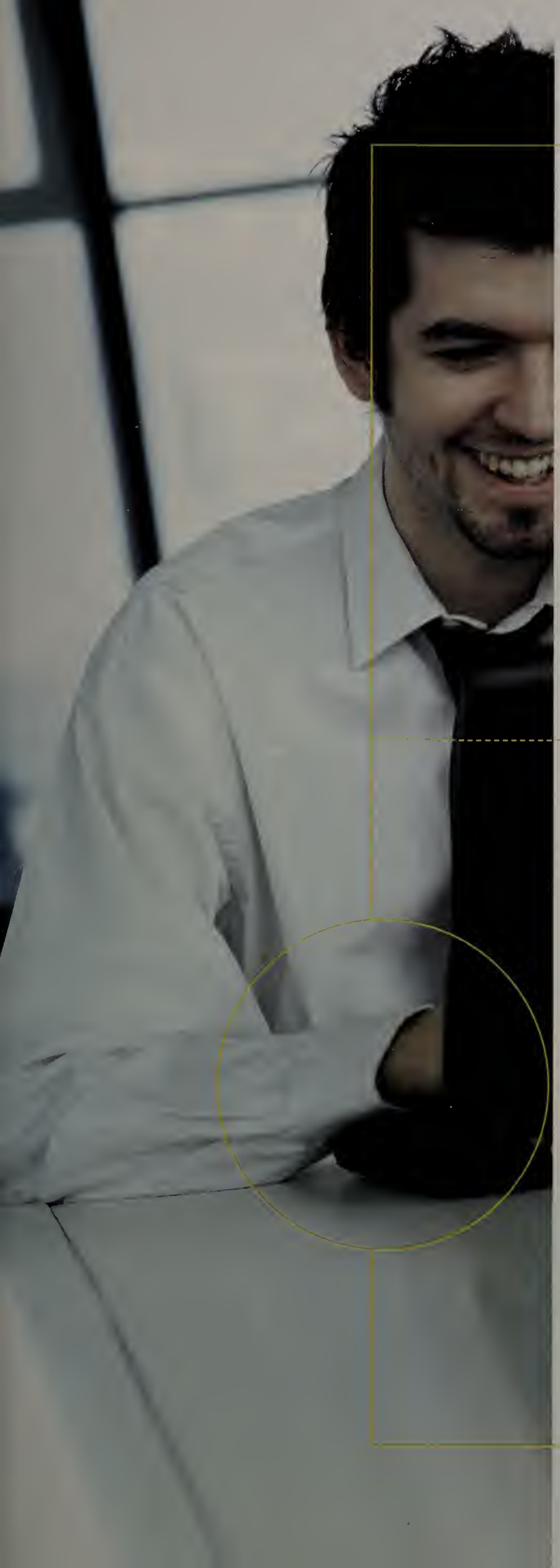
The QoS mechanisms for 10G could stand improvement, says Mike Knoll, central office group leader for Hancock Telecom, which has been using 10G Ethernet blades from Extreme for about a year. His company offers cable television from one switch, and Internet access and voice over IP on the other switch. It's using 2G bit/sec of its own fiber, lighting up more strands as needed.

As it stands now, users set up QoS by designating percentages of a fiber or connection that an application, user or location can use. "We need tighter bandwidth instead of percentages," says Knoll, adding that the ability to designate 10% of a 10G pipe doesn't really offer much additional value. "We need to be able to pick a [set amount of bandwidth]."

A billion bits per second from the campus to the wide area will open up lots of big possibilities, but it's going to take at least a year for 10G to grow into the fullness of Ethernet's next logical exponent. Apart from time and money, there's no reason why the internetworking of corporate and carrier networks across the WAN should falter. Completion of a few more technical specifications should help 10G's adoption, which would help push prices down, while the first few services start to become available.

10G will widen the WAN like never before.

Sweeney is a writer and editor in Los Angeles who has covered IT and networks for 20 years. He can be reached at terry@tsweeney.com.



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Net.Worker

■ PRODUCTS, SERVICES AND STRATEGIES FOR TYING TELEWORKERS TO THE ENTERPRISE

Procom server appliance ups the ante

■ BY JAMES GASKIN, NETWORK WORLD GLOBAL TEST ALLIANCE

NetworkWorld Review

I love all-in-one server appliances for small businesses. The best provide the greatest benefit for most businesses for the smallest amount of configuration time.

The new Taurus from Procom Technology improves on the IT-100 from EmergeCore I tested in early July and was less than satisfied with (www.nwfusion.com, DocFinder: 7230). The Taurus includes wireless support, the print server worked, and it was easier to set up.

Procom should be further down the road than EmergeCore because it bought orphaned technology from Celestix. The company took that hardware and server framework and complemented it with an excellent manual (274 clearly written pages with lots of pictures and easy steps, and plenty of depth, if you want it).

The Taurus easily hurdles the first barrier for non-technical folks adding a server appliance: how to get the server network IP address to match that of the network. When you already have a network and add a server, you must tell the new server what IP address to use. The Catch-22: You must network the server to add the server to your network. That means you need to change your client's static IP address, connect to the server, set the server's static IP address, then change your client settings back. The Taurus' front-panel LCD lets you set the server's static IP address to match your network quickly and easily. This is a big benefit and speeds installation considerably.

Meant to fit between a small company's internal network and an Internet connection, Taurus, like other all-in-one servers, requires you to use its internal file server as your external firewall and Web server. This design relies heavily on the included firewall to keep your file server safe. For that reason, I wanted more management detail about the firewall and more configuration flexibility than Taurus provided. The company could do better. This also means you will have to keep your Taurus software updates current to help maintain a strong barrier against outside hackers.

Once you configure the Taurus' IP address, installation between your network and the world takes only seconds. In my lab, I placed the Taurus between the Comcast cable modem and my internal wiring hub. When I turned on the box it automatically grabbed the Internet information from Comcast and translated my internal IP addresses through network address translation to match the Comcast IP addresses. In less than one minute, internal clients were surfing the Web.

The browser-based administration pages are refined holdovers from Celestix and use a tabbed interface for easy navigation. Finding your way around is easy, but getting into fine details is impossible. Like with other all-in-one boxes, I yearned for an Advanced button to let me drill down another level for configuration flexibility. Other Linux server software (the Taurus is based on an unnamed Linux version) offers such administration control, but Procom has yet to add that to the Taurus.

Setting up the Web server takes only seconds, and one click starts the server in the Administration pages. The Taurus includes FTP client software (WS_FTP LE, or Light Edition) for easy Web-content file transfers to post your information on your Web site. If you prefer not to use the public-access FTP directory, you can choose the directory to hold the Web server files. You also can host multiple Web servers on the Taurus (which makes it more complex to set up), so if Joe's Hardware expands to include Joe's Lumber, each could have its own Web site.

The e-mail server can be set up just as quickly (one click to start the server) and automatically integrates all users created on the system. Any POP3 e-mail client can access the mail server, and Procom includes an excellent Web-based mail client with an extensive manual for explanation.

An antenna to extend your wireless range is included with the 802.11b wireless access card (PC Card). The antenna helps, and using a PC Card plug-in for wireless will make it easy for Procom to upgrade to 802.11a or 802.11g in the future.

Procom doesn't sell direct and doesn't list e-commerce buying options. It has a reseller-based distribution plan, which seems contradictory to making the Taurus so easy to set up and administer, but the company is relying on the dealer network that sells its other storage products.

With a starting price of about $1,700, the Taurus system offers more for about the same money as Novell's and Microsoft's software-only products. The Taurus top-end unit, with 512M bytes of RAM and a 250G-byte hard disk, sells for about $2,550 and will handle all server functions for a business with several hundred users.

Net Results

Taurus server

OVERALL RATING **3.85**

Company: Procom, (949)852-1000, www.procom.com **Cost:** About $1,700 to $2,550. **Pros:** Easy installation; front-panel LCD for installation, status readouts and management; companion CD with Eudora e-mail client and FTP client software; Web, e-mail, file and print servers. **Cons:** Management split between server LCD and Web administration pages; too little management detail over server and operating system; only available through resellers.

The breakdown

Manageability 25%	3
Features 25%	4
Ease of setup 20%	5
Documentation 20%	4
Reporting tools 10%	3
TOTAL SCORE	3.85

■ **Scoring Key:** **5:** Exceptional; **4:** Very good; **3:** Average; **2:** Below average; **1:** Consistently subpar

The Taurus isn't the ultimate server appliance, but it's getting closer. Lack of administrative controls lowers the high ratings gained by the easy-setup LCD control window and the clever inclusion of wireless support. Another software upgrade or two and this could be a real winner. ■

Short Takes

■ **Hughes Network Systems** recently announced a satellite-based Wi-Fi offering designed for the Winnebago set. The service, which Hughes will offer through wireless ISPs partners, will use Hughes' Direcway broadband satellite service, which provides nationwide coverage. Hughes recently completed a pilot of the service, which is available in several recreational vehicle parks in Southern California. Although a niche offering, the RV market is growing and today accounts for one in 12 vehicles, according to a University of Michigan study. Many motor homes are owned by retired baby boomers who are demanding Internet services while on the road, Hughes says. Pricing for the service is not available. www.hns.com

■ **Research in Motion** recently announced support for IBM Lotus Instant Messaging Everyplace 3. This gives BlackBerry users instant message features such as presence awareness, chat, and messaging between desktop and mobile users. The software is available through Lotus resellers. www.lotus.com

■ **Smarthome,** a home-automation products vendor, recently announced a service that lets users view and monitor their homes, and control home electronics such as lighting, thermostats, home entertainment systems and appliances. The service also sends alerts from motion-detection and other monitoring services to a user's PC, PDA or cell phone. The PC-based service comes in two versions. SmarthomeLive includes video monitoring and remote control of devices, and image archiving. SmarthomeLive Action doesn't include video camera monitoring. The services cost $10 and $8 per month, respectively. Required hardware kits cost $300 and $250

Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

API eases network processing integration

■ BY PHILIPPE DAMON AND BERNIE KEANY

Network processors let network equipment vendors develop gear that customers easily can upgrade to tap new applications and protocols. However, a lack of hardware interface standards and software APIs has kept vendors from adopting network processor technologies.

The Network Processing Forum (NPF) was launched in 2001 to solve the problem by establishing a common and open set of network processing hardware and software interface specifications, along with a well-defined set of objective performance benchmarks.

Earlier this year, the group released the NPF IPv4 Unicast Forwarding Services API Implementation Agreement. This specification details a set of open, implementation-neutral APIs that control-plane software can use to manage IPv4 forwarding plane functions in network-processing elements.

The forwarding plane forwards packets at line rates. The control plane controls and modies the behavior of forwarding plane components. It processes changes and updates received from network routing protocols such as Open Shortest Path First and Border Gateway Protocol.

Using common APIs lets independent software and network processor vendors develop complete IPv4 forwarding solutions for network processing elements, which are unique combinations of hardware and software. It also simplifies the difficult task manufacturers face in migrating their existing control-plane software to network-processor-based systems.

In the case of a multi-protocol router, control plane elements use an application called a route table manager (RTM) to create and maintain an accurate routing information base (RIB) table that contains all known network-layer connectivity information. An RTM uses an RIB to generate an appropriate subset of mapped IP destination addresses to next hops, routing metrics and other data that is downloaded to the forwarding plane elements using the NPF IPv4 services APIs. The forwarding plane elements store the data in a forwarding information base (FIB) table as described in RFC 1812.

Before the NPF IPv4 Unicast Forwarding Services API was available, the APIs that facilitated communications between control plane elements and forwarding plane elements were proprietary. Silicon manufacturers had to establish relationships with individual network stack vendors to create appropriate interfaces. As the number of network protocols, hardware vendors and software vendors grew, the software libraries needed to maintain these interfaces became costly and unwieldy. The IPv4 Services API Implementation Agreement establishes standard APIs so all these components can interoperate easily.

The NPF IPv4 Unicast Forwarding Service API Implementation Agreement optimizes on a range of network platforms, including everything from enterprise-class switches and routers to carrier-class core IP routers.

This flexibility is enabled by two distinct modes of organizing and manipulating the IPv4 unicast forwarding information stored in FIB tables. The unified mode, or single FIB table implementation, is most appropriate for network designs in which platform memory and cost are critical considerations, such as a departmental router. The discrete mode, or multiple table implementation, supports multiple disaggregated FIB tables, enabling the reduction of processing overhead. This is critical in core router implementations with dense high-end platforms that have hundreds or thousands of interfaces.

The IPv4 Service API Implementation Agreement is the first in a series of APIs to be established by the NPF. APIs for Multiprotocol Lable Switching, Differentiated Services, IPv6 and other network services should follow quickly.

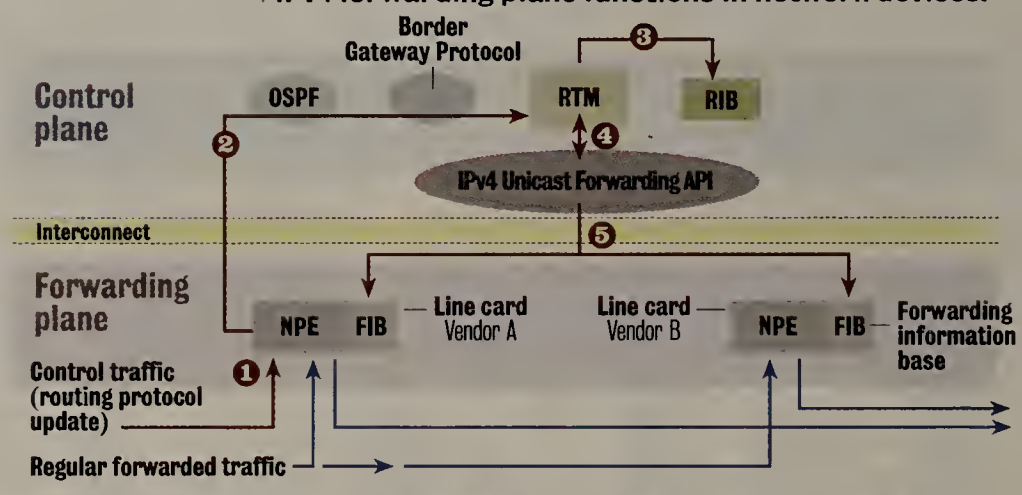
Broad adoption of these services APIs will let network device vendors select the components that best meet their requirements and avoid redesigning their systems when choosing new network processing hardware and software.

Damon is chief software engineer for network processing and Keany is network processing software architect at Intel. Both are software task group chairs of the NPF. They can be reached at damon@fr.ibm.com and bernie.keany@intel.com, respectively.

■ HOW IT WORKS

NPF IPv4 Unicast Forwarding Services APIs

Control plane software uses NPF's API to manage IPv4 forwarding plane functions in network devices.



1. Open Shortest Path First (OSPF) routing update arrives at network processing element (NPE).
2. NPE delivers update to OSPF routing protocol stack in the control plane.
3. Route table manager (RTM) gathers information from OSPF routing protocol stack and builds routing information base (RIB) Table.
4. RTM calls the IPv4 Unicast Forwarding APIs to download the forwarding information.
5. One or more messages are sent from the APIs' implementation to one or more NPEs to populate the forwarding information base (FIB) in each NPE.

Ask Dr. Internet

By Steve Blass

Windows machines in our network started acting strangely two weeks ago. Windows XP machines have rebooted repeatedly, file sharing doesn't work, and Word complains about Office Assistant being installed improperly. When we try to go to the Windows Update site, we get a blank page. Is this related to the Remote Procedure Call security advisory Microsoft recently released?

You might be the victim of attacks based on the recently announced Microsoft RPC buffer overflow problem. Installing the patch provided in the MS03-026 security bulletin (details at www.nwfusion.com, DocFinder: 7231) could give you access to the Windows Update page, so the rest of your critical updates can be installed.

The worms based on this Distributed Component Object Model exploit install root kits that download additional attack software, so the only secure response is to reinstall everything from clean media after reformatting the hard drive, and then patch the system before reconnecting it to the network.

Because few will do this, you should patch Windows systems before they are compromised. Recent antivirus software updates will identify and clean out some worm variants. Perimeter firewalls protect most business networks, but home and academic environments that do not block Windows networking ports from the Internet are vulnerable.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD INSIDE THE NETWORK MACHINE

Mark Gibbs

Storage appliances and the latest on RAID

As we've been talking about Server Message Block support, this week is a good time to discuss storage appliances that offer this service. The advantage that these devices provide is the ability to add storage to your network painlessly and cost-effectively.

Our poster child for this class of devices will be the Snap Server 2200 from Snap Appliance (www.nwfusion.com, DocFinder: 7234). Snap makes a range of these network-attached storage devices designed for workgroup, departmental or enterprise use (we were going to use the "d" word — deployment — but thought better of it).

The differences between these categories are storage capacity — 80G bytes is the low end and 2.16 terabytes in a single box is the high end — and features such as which RAID levels are supported, bundled utilities and form factor (desktop for the low end and rack mount for the high end).

So this leads us to a quick diversion on RAID, which stands for Redundant Array of Inexpensive Disks. Note that some people claim that RAID stands for "Redundant Array of Independent Disks," but not so. Now you have a fine trivia card to pull out when the occasion arises.

The idea of RAID is, at least at first blush, pretty simple: You take several low-cost drives and write your data across them in such a manner that if (heaven forfend) a drive goes bad (such as a data error, a head crash or the entire drive being sucked into a wandering wormhole and spat out in an alternate universe where data recovery is unlikely), you have a back-up copy.

Yep, simple in theory and anything from fairly simple to fiendishly cunning in practice. First, you have RAID 0, which is useless in terms of providing redundancy but has its own performance benefits.

RAID 0 distributes the blocks of each file across multiple disk drives (this is called striping), which significantly improves performance by letting reads be split across the duplicated drives. Thus, while one drive is performing one I/O request the other is handling a different request. Level 0 is the fastest and most-efficient RAID type but has no fault-tolerance.

The next level, RAID 1, provides disk mirroring. This keeps two disk drives synchronized so that if the primary drive fails you have a real-time duplicate. RAID 1 is used for high-performance, fault-tolerant environments.

RAID 2 is for disk drives that do not have built-in error detection. As all SCSI drives have built-in error detection and as RAID systems usually use SCSI drives, RAID 2 is not generally used.

RAID 3 is the same as RAID 0 but stripes the data across multiple drives at the byte level and has a single dedicated disk drive that stores error-correction data. This level delivers good performance, and can detect and correct data errors that a drive's built-in error correction can't handle. RAID 3 requires drive controllers that provide hardware support for byte striping.

RAID 3 is better suited to environments in which access to large sequential records is the norm, but it doesn't let multiple reads and writes be overlapped. It also requires special drives (called synchronized-spindle drives) to avoid performance degradation with small records.

RAID 4 is the same as RAID 3 but with block-level rather than byte-level striping. RAID 4 is not used as it offers no advantages over RAID 5.

The highest level, RAID 5, uses block-level data striping across multiple drives and error correction also across multiple drives. This is considered the best choice for multi-user environments in which writes are less common than reads.

The Snap Server 2200 can be configured to use RAID 1 (mirroring), RAID 0 (striping) or Just a Bunch Of Disks (JBOD). Actually JBOD is not RAID at all but "disk spanning," which makes the drives look like a single huge drive — great for capacity, but like RAID 0, no redundancy. On the other hand, JBOD is better than RAID 0 because a disk failure under RAID 0 makes it really hard to recover data — it is striped across the drives. Under JBOD the blocks that make up files will be easier to find and reconstruct.

Next week, we get the Snap Server 2200 running. Upload your data to gearhead @gibbs.com.

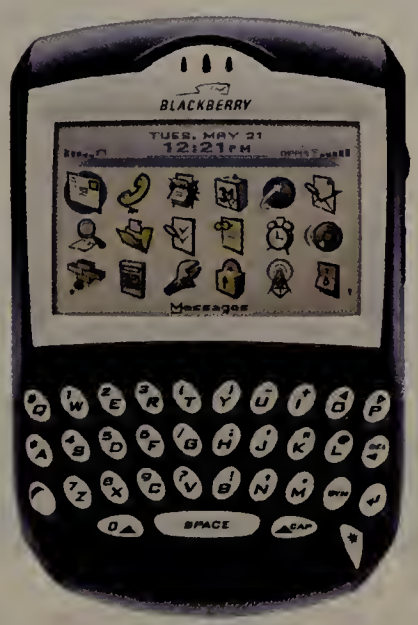
Storage
Subscribe to our free newsletter.
DocFinder: 5434 www.nwfusion.com

CoolTools

Quick takes on high-tech toys
By Keith Shaw

T-Mobile launches color-screen BlackBerry

T-Mobile and Research in Motion last week announced availability of the tri-band BlackBerry 7230 device, which has a color screen and works on T-Mobile's GSM/ General Packet Radio Service network. The 7230 costs $400, plus $30 per month for wireless e-mail service (for existing voice T-Mobile customers), the companies say.



The BlackBerry 7230 includes access to 10 e-mail accounts.

The 7230 includes access to up to 10 corporate or personal e-mail accounts and Short Message Service functionality. The phone includes call waiting, conference calling and call forwarding. The device can be held up to the ear like a standard mobile phone, or users can attach the hands-free headset. It also features a calendar, address book, memo pad and task applications that can be synchronized with a PC.

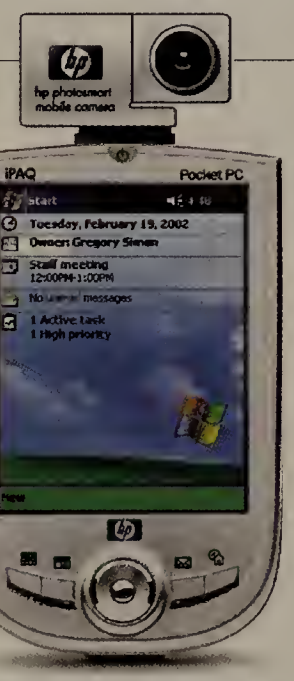
The handheld works on the 900-, 1800- and 1900-MHz GSM/GPRS networks, which means customers can use the same phone number around the world as the result of T-Mobile's international roaming agreements, the company says. For more information on the new 7230, go to www.nwfusion.com, DocFinder: 7235.

Take photos with your iPaq

HP announced last week an attachment to its iPaq line of PDAs that will let users take digital images with their devices. The HP Photosmart Mobile Camera is an iPaq attachment that lets you take pictures and send them to a Bluetooth-enabled printer.

The device is a 1.3-megapixel camera that features a 4X digital zoom and a 180-degree rotating lens, and weighs only 1.1 ounces. It uses the Secure Digital I/O interface to attach to an iPaq (the PDA must have SDIO capabilities). The device also has automatic settings that adjust the light levels, shutter speeds and exposure time of the camera. The attachment also includes digital-video-capture capabilities, including adding an audio message to the images.

Pricing has not been announced, and the device is expected to be available in October.



HP's new camera for PDAs lets you send pictures to a Bluetooth printer.

Get 21 inches for the price of 19

No, this isn't the subject header on the latest spam e-mail, it's the pitch from NEC-Mitsubishi on its latest flat-panel LCD monitor. The new NEC MultiSync LCD1960NX monitor includes screen-enhancing technology that provides a viewing area comparable to that of a 21-inch CRT monitor, the company says.

The $749 monitor includes features such as 250 cd/m of brightness, a 600:1 contrast ratio and a maximum resolution of 1,280 by 1,024 pixels. It also includes a height-adjustable stand to better fit the viewing angle of users, NEC-Mitsubishi says. It also supports NEC's NaviSet software, which lets users and administrators adjust display settings with a mouse and keyboard instead of using the buttons on the monitor.

HP launches 17-inch widescreen notebook

HP also last week launched a 17-inch widescreen notebook, joining other companies in the market with widescreen offerings (including Apple, Dell and Gateway). This is HP's second foray into widescreen notebooks, as it recently launched a 15.4-inch version in June (the Presario X1000).

The HP Pavilion zd7000 includes a 17-inch display with a 16:10 aspect ratio and WXGA+ resolution (1,440 by 900 pixels). It also includes an NVIDIA GeForce FX Go5600 graphics processor and built-in Harman Kardon speakers, HP says.

The notebook has an Intel Pentium 4 processor with speeds up to 3.2 GHz; integrated 802.11g wireless LAN connectivity; and support for Secure Digital, MultiMedia, Memory Stick, Memory Stick Pro and SmartMedia cards. An IEEE 1394 (Firewire) port and four USB 2.0 ports are available for peripheral expansion. The zd7000 has a thin design (1.8 inches thick), but weighs about 9.3 pounds. The zd7000 is priced starting at about $1,500, and will be available later this month on HP's Web site.

Shaw can be reached at kshaw@nww.com.

The HP Pavilion zd7000 has a 16:10 aspect ratio and 1,440-by-900 resolution.

EDITORIAL
Beth Schultz

10G: Worth your attention

Dismissing 10G Ethernet for the enterprise comes easily to many industry watchers. "That's just too much bandwidth for your average user organization," they typically scoff. "Truly," they say, "10G belongs in the carrier domain." Even the network engineer I asked to write a story about 10G switches for the enterprise argued that point at first. The gist of his argument: All the action is in the public network.

Maybe, maybe not. 10G Ethernet is a huge amount of bandwidth, and carriers with their chunky cross-country and metropolitan-area routes have good reason to grab up 10G switches. For them, 10G makes for a reasonable, increasingly cost-effective alternative to traditional WAN technologies such as packet over SONET and ATM.

But a growing number of enterprise users are finding 10G a compelling story, too.

Today, 10G, maturing nicely since stamped with the IEEE's approval in mid 2001, is worth everybody's attention. The reasons are piling up, as we explore in our special "10G: Big, bad bandwidth" coverage beginning after page 26.

For starters, 1G oftentimes isn't quite enough anymore for many corporations. The 10G version of the technology is proving useful on high-volume storage-area networks and back-up segments, within data centers heavy with 1G-based switching and routing cores, and for carrying bandwidth-intense applications such as IP telephony and real-time audio and video multicasting.

And then comes the basic maturation of a technology that pushes it from the "needs to be watched" to the "needs to be sampled" stage. In this case, technology refinements and cost reductions are coming together to make 10G, at least in trial mode, a palatable decision.

Take just one vendor, Extreme Networks, as an example. The company is working out the flakiness in its initial "get to market fast" 10G blades, alleviating the throughput problems that limited interconnections to 4G bit/sec, and the latency and jitter errors that botched transmissions. Its Mariner switch, set for release by year-end, will provide six-port 10G blades at $8,000 apiece.

Finally, service providers are talking about edging into the 10G enterprise action. For example, AT&T has talked about developing 10G metropolitan-area network (MAN) services that would find their way to the table in another year or so. The potential there is grand, as the enterprise LAN merges seamlessly with the MAN and then even the WAN.

Gartner expects to see a big boost in 10G pickup beginning next year. It forecasts that 10G volumes will begin at least tripling year over year, from 5,000 ports sold next year to 185,000 in 2007, with the average per-port pricing dropping to about $7,700. Now those figures are nothing to snigger at.

— Beth Schultz
Editor, Signature Series
bschultz@nww.com

opinions!

Not cost-effective

Regarding "BellSouth lowers DSL pricing" (www.nwfusion.com, DocFinder: 7223): To do an adequate cost comparison, you should ratio the upload/download speeds to the monthly cost. That way, you have a dollars/speed ratio for comparison purposes. Losing three-quarters of your download speed for a reduction in monthly payment of $10 might not be that cost-effective or worth the speed loss.

Frank Cicchetto
Consultant
MacFAC.com
Reston, Va.

Filter factors

After reading "Filters on routers: The price of performance" (DocFinder: 7224), I was a bit perplexed because I have never run into any problems with Cisco routers and access lists. My company uses all manner of Cisco access routers in our network, from 1600s to 3700s, depending on circuit size. I was shocked by your report that the 2651 couldn't keep up with even a single T-1 when access control lists (ACL) were applied. We don't have any of these routers in our network, but because the 2651 is a significant improvement over the 2621, I figured the performance should be better.

It's a good thing you made the 2651 configurations available. After looking at them, it seems that the tester had an ax to grind with Cisco. Who turns on logging for every line in a 256-line ACL? You also failed to turn off console logging with the simple command "no logging console." Because you also did not enable Cisco Express Forwarding (CEF) switching, every packet being checked against the ACL will be fast or process-switched, and every log message sent to console will cause a processor interrupt.

You'll no doubt respond by saying that if Cisco had chosen to participate, it could have selected a more appropriate platform and configuration. If your editorial policy is that vendors must cooperate to get a fair shake, I would suggest leaving out vendors that decline your requests instead of bashing them in your review.

I also would point out another major difference between Cisco and the other vendors, which might have helped in your review. Cisco's Web site contains the entire body of knowledge with regards to configuring, optimizing and troubleshooting their products. If you had been a real-world user, you could have started at www.cisco.com and found out how the performance issues you experienced were not a result of "aging hardware," but your own configuration choices. The same level of support is not available to the public for the other vendors' equipment.

Ben Setnick
Dallas

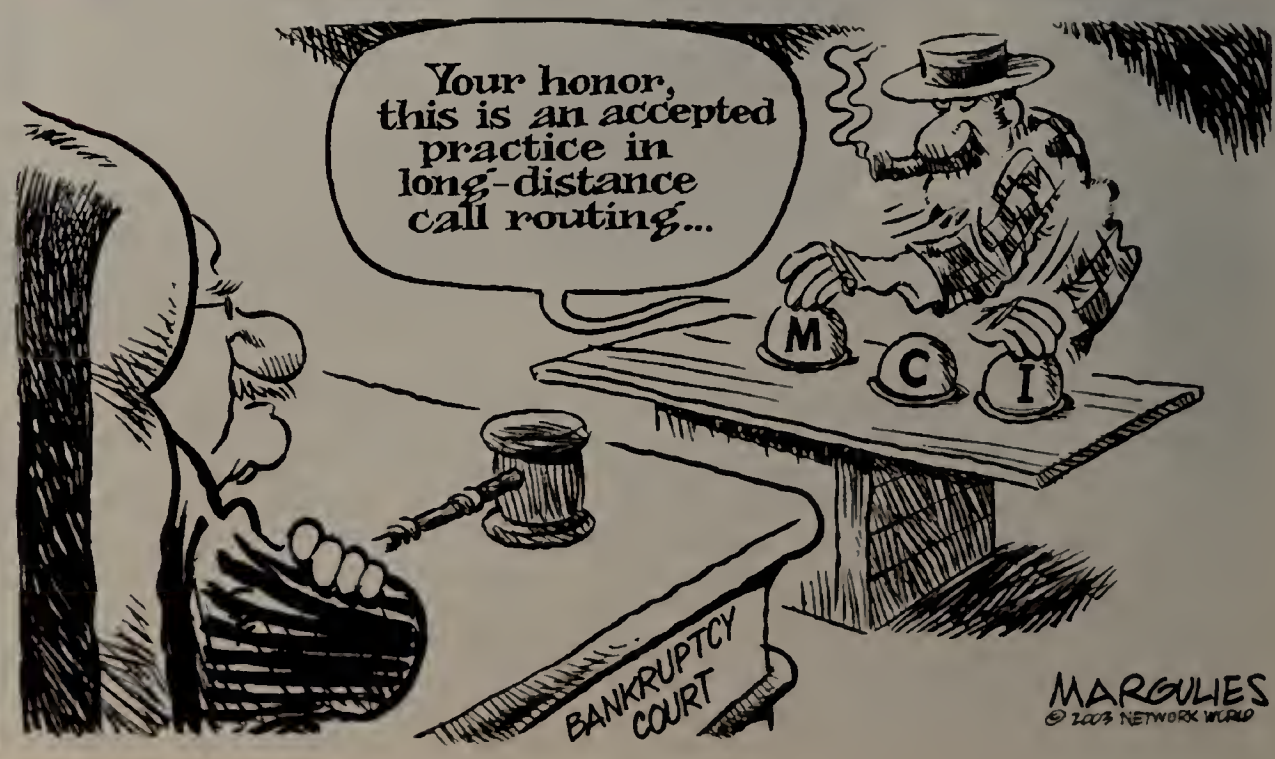
Reviews author David Newman replies: We tested all routers with logging enabled. Further, Cisco saw and signed off on configurations and test results before publication. While we certainly have no ax to grind with any vendor, the results of this test suggest some products handle filtering and logging with no performance hit and others don't.

Originally the test plan called for a separate set using filter-acceleration methods. In Cisco's case, mechanisms such as CEF and Turbo ACLs might have improved performance. However, none of the other devices tested needed acceleration methods, so we dropped this test event.

I respectfully disagree that tests should only include products from participating vendors. Our allegiance lies with end users, not the marketing departments of equipment makers. If a commonly used product encounters performance problems, this information is of interest to enterprise network professionals.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

More online! www.nwfusion.com Find out what readers are saying about these and other topics. **DocFinder: 7222**



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STRATEGY SESSION

Jeff Kaplan

ASPs prepare to make comeback

Now they are attempting to capitalize on customers' growing frustrations with traditional application acquisition models.

Many in the industry see the Oracle-PeopleSoft tug of war as a clear indication of the inevitable maturation and consolidation of the enterprise software industry. However, there is another interpretation of the real meaning of this intramural dispute. As the features and functions of today's enterprise applications become less differentiated, a greater emphasis is placed on the way these applications are delivered and managed. It is this fundamental shift that is rekindling the fortunes of a nearly extinct species of suppliers: application service providers.

Enterprise applications ranging from CRM to supply-chain management (SCM) emerged as essential tools for corporate re-engineering in the 1990s. But it didn't take long for companies to become frustrated attempting to implement, integrate and maintain enterprise applications. Gartner estimates it now costs five to 10 times as much as original licensing fees to implement enterprise software. Given the hidden costs, many companies aren't getting the ROI they expected from these applications and are looking for alternatives.

Enter the ASPs. Like many artifacts of the Internet craze, ASPs failed to meet customers' original expectations and saw their fortunes fade. But now they are attempting to capitalize on customers' growing frustrations with traditional application acquisition models and willingness to outsource any corporate function that others can manage more economically. ASPs not only are offering a variety of software subscription services, they are expanding into business process outsourcing and utility computing services to satisfy customers' needs for new business solutions with more-flexible pricing methods.

Yet, even as ASPs gain momentum, they are facing another round of competitive pressures. New "net-native" ASPs, such as Salesforce.com and NetLedger, are selling low-cost CRM and financial applications built to be delivered via the Web. Traditional outsourcers and telecom carriers are offering an expanding array of hosting services. And even the independent software vendors (ISV) are aggressively expanding their application hosting and management service capabilities.

If you are considering outsourcing, ask yourself these questions:

- Which applications are most difficult for you to implement, maintain and manage?
- Is there anything truly proprietary about these applications that prevents you from using an outside service provider to host and manage them? If not, what type of skills are most important for you?
- Do you need to turn to an ISV hosting and management service that has in-depth expertise and experience in its own software applications? Or do you need to integrate a variety of applications in a fashion that many of the independent ASPs can do via their multi-tenant services? Or do you need help managing both your applications and hardware systems, as the major outsourcers do best?

It is a good time to look at application outsourcing alternatives. By clearly understanding your application management and hosting requirements, you can take advantage of the growing assortment of independent and ISV-managed ASP alternatives.

Kaplan is managing director of THINKstrategies, a consultancy in Wellesley, Mass. He can be reached at jkaplan@thinkstrategies.com.

REALITY CHECK

Thomas Nolle

Time to end the MCI saga

Forcing MCI to liquidate will, perhaps, hurt a few of those who were responsible and a lot of everyday people who did nothing wrong.

As MCI struggles to emerge from Chapter 11 and regain the confidence of its customers, it seems as if every procedural business step forward is followed by a new revelation. The latest is that MCI might have accounted for inter-carrier calls incorrectly, dodging payments to both regional Bell operating companies and interexchange carrier competitors. Some press reports say the total amount involved could reach billions of dollars.

We know what to do with individuals who break the law: Prosecute and jail them. MCI's proving that we don't quite know what to do with a company that breaks the law. Companies, after all, are not living organisms but simply collections of employees, stockholders and real estate. Even if all the charges levied against MCI are true, did all the workers know about the foibles? Probably not, so jailing the whole company doesn't seem logical.

If we agree that we're not going to put "MCI" in jail, then what are we going to do? Some competitors have argued that MCI should be liquidated because letting it resume operation cleaned of debt would "reward" it for its misdeeds. Some want hefty fines levied. There's a range of options that all reduce to "kill the company" in some way or another. So should we kill MCI by liquidating it? At the very beginning of this saga of revelations last year, I thought we should do just that. Now it's too late.

There are thousands of secretaries, salespeople and others working at MCI today. The number who might have known about any company irregularities is minuscule. Forcing MCI to liquidate will, perhaps, hurt a few of those who were responsible and a lot of everyday people who did nothing wrong. We just agreed that we can't jail them for simply having worked at a company that some want to characterize as a criminal enterprise. Can we then count them unemployed for that same sin?

What about the auditors and regulators who were supposed to watch over this whole process? What about the business press that reported on glowing growth during the very period when accusers say the company was cheating on its inter-carrier accounting? Surely these people had at least as much responsibility for the problems at MCI as the average MCI worker did. How does liquidating MCI, or withdrawing government contracts to effectively force a failure of the company, deal with these overseers?

Then there are the customers. All of MCI's detractors/competitors are eager to see them reapportioned among the survivors — including them, of course. Maybe this would be healthy for the remaining players, but it's kind of hard on the users of MCI services. How will each of the users, each of the networks, be transitioned to another carrier? Imagine a liquidated MCI, with lines and switches bought at fire sale prices. What happens to the traffic those elements carried, and how long will it take to eliminate the disruption in service that this liquidation creates? To protect customers, we'd almost have to sell MCI intact, leaving the buyer to continue to fulfill customer contracts.

And who benefits, then? If MCI's operation was, as alleged, created in part by criminal behavior, do we decriminalize it by selling it off? If AT&T or SBC or Verizon acquires MCI, will they then acquire the criminal and civil liability for future disclosures of wrongdoing? The survivors would acquire the same assets MCI now has. If they're tainted for MCI, they're tainted for everyone else. You can't launder companies.

We're at the point where we've let the MCI deal play out to the very edge of rehabilitation. We've accepted the past sins we've known about. We should accept this one, too. We've come too far — but in particular MCI employees and customers have come too far — to decide that one more accusation will break the back of MCI's emergence.

Continue to investigate. Punish the guilty through due process. Let the innocent get back to work.

Nolle is president of CIMI, a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.

NetworkWorld Review

SOFTWARE-BASED WEB APPLICATION FIREWALLS

AppShield edges InterDo in battle of Port 80 filters

■ BY THOMAS POWELL, NETWORK WORLD GLOBAL TEST ALLIANCE

Traditional firewalls — when properly configured and managed — do a good job of thwarting many network-level attacks, but do little to address gaping holes in Web applications where intruders commonly attack Web sites directly through form submissions or URL manipulations.

A new class of products — often-dubbed Web application firewalls — attempt to thwart Port 80 focused attacks by using blacklist- and whitelist-style input filtering. We examined six software-based offerings: eEye Digital Security's SecureIIS, KaVaDo's InterDo, MultiNet's iSecureWeb, Sanctum's AppShield, Turillion Software's eServer Secure and webScurity's webApp.secure. We tested all the products on Microsoft's Internet Information Services (IIS) but most also work with Linux and Apache. A future review will cover hardware-based products.

InterDo and AppShield stood above the rest in terms of ability to defend against attacks and suitability for large-scale Web site deployments. While extreme flexibility is the key to InterDo, the dynamic policy generation and strong default configuration of AppShield gave it a slight edge in our evaluation and earned it our World Class award.

Common attack methods come into play

To understand Web application firewalls you have to understand what they attempt to defend against. The most basic application attacks modify an HTTP request to cause a problem on the server or force it to divulge useful information. Generic attacks might use long URLs to trigger buffer overruns, attempt to traverse the site's root directory to run trusted commands, or exploit extended HTTP features to support online collaboration using WebDAV. WebDAV (Web-based Distributed Authoring and Versioning) is an extension of HTTP that lets users collaborate via the Internet.

More sophisticated attacks rely on knowledge of how the Web application works. In database-driven sites using dirty URLs like http://www.sitename.com/app.asp?id=5, SQL commands might be appended to the URL in an attempt to dump useful data or gain write access to the back-end database. Forms also might be open for SQL injection and tampering with hidden data fields and manipulation of maximum data size limitations, which can lead to buffer-overrun problems. Given the multitude of possible attack methods, any data from the user — be it a simple HTTP request, URL or form submission — should not be trusted implicitly.

Divergent defensive strategies

To combat potential exploits, a Web application firewall will take one of two approaches. A negative model or blacklist product looks for common attack signatures and warns the administrator or blocks the user when it encounters one. A positive-model or whitelist firewall determines all the allowable requests, and inputs and disallows everything else. Some products try to blend the two approaches, but, essentially, all the products tested emphasize either a positive or negative model.

A few of the products also addressed common Web server information leakage issues such as masking server headers or sending back generic or configurable error pages. It was disconcerting, however, to see how easy it was to identify some of the application firewall products via hard-coded error pages or telltales (some signature response that is different enough for the intruder to know what kind of tool is in play) in response headers. Trying to improve security simply by obscuring potentially dangerous information is not true security. Such blatant information leakage seems foolish in a security product and fails to address the well-known fact that reconnaissance is a key part of successful intrusion strategies.

These tested products spread an obvious spectrum of cost vs. functionality. Those employing the positive model generally are more expensive and sophisticated than the products that use the negative-model approach (see pricing in NetResults box, page 49). Another key cost factor is the underlying architecture. EServer Secure appears intended for single-server implementations, while AppShield, InterDo and webApp.secure serve more as proxies, capable of protecting multiple servers. Higher-end products AppShield and InterDo also possess remote-management capabilities and distributed architectures, features designed with server farm deployments in mind.

Sanctum's AppShield edged out the competition as our World Class award winner because of its dynamic policy generation and strong default configuration.

Raise your AppShield

Sanctum's AppShield boasts a fully distributed architecture designed for server farm deployments. Components include a crisp Java-based management console, a configuration server (mysql is used for database support) and one or more firewall nodes.

AppShield uses a positive model built around what Sanctum calls its Dynamic Policy Recognition Engine. Outgoing pages are scanned and the appropriate whitelist of allowable inputs is constructed accordingly. Such dynamic policy generation is a considerable help in getting the product up and running quickly, and maintaining security policies as the site/application changes. The general policy defaults put in place when one chooses the desired security level are easily loosened by browsing or crawling the site using a trusted IP address, if you find that the default level is too strict for a site or application.

AppShield has a "passive mode" that logs but does not block requests that would violate policy. This mode lets policies be tested, which the administrator can modify selectively in real time by right-clicking the request that is in violation. If there are multiple AppShield nodes deployed in a server farm, the passive mode role could be permanently given to a single node. That node could then serve as a monitor or honeypot for the entire farm. In general, AppShield gets high marks for ease of configurability.

AppShield's dynamic policy generation worked well to prevent forceful browsing by automatically restricting traffic patterns to legitimate navigation paths and limiting form-field tampering. AppShield's default policies, however, were more restrictive than other products tested when it came to preventing simple SQL injection. The default policies also block standard attacks such as buffer overruns, directory traversals and suspicious URLs. For preventing repeated attacks that violate security policies, AppShield can notify a Check Point firewall using the Open Platform for Security (OPSEC) standard that a particular IP should be blocked at the network level.

Customizable error pages are provided, but there are some shortcomings. Although the error page is passed with an HTTP reason code to display, the page itself is retrieved using a redirect, meaning that the underlying HTTP response code is always a 302 (a redirect) followed by a 200 (Ok) — not the code that reflects the actual state of the response. Like many of the firewalls, AppShield runs fast and loose with HTTP response codes, which is troubling from standards compliance and raises the possibility that potential hackers might fingerprint the security software in place from non-standard responses.

On a side note, AppShield takes advantage of being a proxy to provide some interesting security-oriented features

that go beyond the usual menu of application firewall options: URL mapping (including regular express matching) and the ability to globally prohibit direct downloading of image and multimedia files, often dubbed "leeching." This interesting feature suggests the possibility of application firewalls eventually merging with authorization and access-control functionality to provide a complete application security framework.

InterDo can do

KaVaDo's InterDo was designed with a large distributed deployment in mind. One or more server nodes communicate with the Java-based management console via built-in Secure Sockets Layer (SSL) encryption — a feature none of the competing products equal. The application server nodes run as a set of services (in the Windows environment).

Although there is no central configuration server, administration of all nodes can be done from a single console. Strict password requirements and the ability to set up multiple users with different administrative privileges show that InterDo is serious about keeping its house in order, while supplying security for the Web application.

InterDo uses a positive-model approach with some novel architectural concepts. Trusted and untrusted zones are joined by what KaVaDo calls "tunnels," an abstraction describing a connection between trusted and untrusted IP address and port combinations. Within the metaphor of a tunnel, security policies are segregated into functional areas called "pipes," several of which can be combined within a single tunnel and selectively applied to one or more applications in a configurable order of precedence. Examples of pipes include general vulnerabilities (URL, header and entity pattern matches), database issues (parameter screening), cookies and HTTP methods. Default pipes do a good job with common buffer overruns, directory traversals and SQL injection. The default settings did not stop form manipulations by default, but it is possible to set up custom tunnels and rules.

Strict password requirements and mutli-level administrative rights show InterDo is serious about keeping its house in order.

InterDo gives administrators a great deal of flexibility in configuring security policies — more so than any other product we tested. On the downside, initial configuration is nowhere near as easy as AppShield's and is probably best undertaken only after reading the manual very carefully.

There is a "lean mode" that lets administrators monitor and selectively modify certain pipes in real time, and requests that run afoul of the security policies are blocked while these refinements are made. This is a safe and helpful way to manage the complexity of configuring multiple pipes.

Another helpful management feature is the update service that can securely update pipes in real time using SSL and digital signatures.

InterDo has an IP-blocking feature that temporarily prevents continued access from visitor IP addresses that have generated enough security policy violations to constitute a suspect pattern of malicious behavior. Suspect attackers are given a security score (high, medium or low) and blocked for varying durations. The response to further requests from a blocked IP is simply a dropped connection, but it might be better — especially for Level 1 attacks — to have the option to show the possibly malicious user a configurable message. For those with a Check Point firewall, InterDo is also OPSEC-compatible for firewall-based network blocking.

SecureIIS: URLScan on steroids

EEye Digital Security's SecureIIS has by far the best user interface of all the products tested. The program uses an interface similar to Microsoft Outlook's that makes configuring this negative-model application firewall trivial. Unfortunately, SecureIIS lacks the depth of many of the other products and appears to do little beyond what a capable administrator could do with Microsoft's free URLScan tool.

While SecureIIS could deal with malformed requests exceeding size limits and basic URL tampering, it couldn't detect and block any form tampering or careful SQL injection.

Furthermore, the product sent back the inappropriate 406 "Not Acceptable" HTTP response code on request rejection, rather than 403 "Forbidden" or 404 "Not Found" message, as it probably should. This is the wrong response code and informs a potential intruder that SecureIIS is being used.

SecureIIS does have some nice features to ease deployment in a multi-server environment by letting policies easily be replicated to other systems. The product also has some basic file-integrity monitoring features that could be useful if an intruder penetrated a machine, but they seem out of place in an application firewall offering.

SecureIIS is targeted at users looking to have the support and ease of use missing from URLScan. Interestingly, eEye recently announced a free personal-use version of its software that makes this product an obvious replacement for URLScan and obvious first step for those IIS administrators new to application firewalls.

EServer Secure for the entry level

Turillion's eServer Secure is designed specifically for the IIS Web server environment. Based on Internet Server Application Program Interface (ISAPI) technology, eServer Secure combines a host-based architecture with the flexibility of a

Net Results

RATING 4.6 WORLD CLASS WINNER

AppShield 4.0

Company: Sanctum, (408) 855-9500, www.sanctuminc.com **Price:** Starting at $15,000. **Pros:** Automatic rule generation, good flexibility. **Con:** Complexity.

RATING 4.5

InterDo 3.0

Company: KaVaDo, (212) 302-2400 **Price:** Starting at $15,000. **Pro:** Incredible flexibility. **Con:** Complexity.

RATING 3.55

SecureIIS 2.0

Company: eEye Digital Security, (949) 349-9062, www.eeye.com **Price:** Starting at $995; Windows only. **Pro:** Simple one-button security for basic attacks. **Con:** Incomplete coverage of possible Port 80 attacks.

RATING 3.4

webApp.secure Professional 1.1

Company: webScurity, (763) 786-2009 **Price:** $10,000 per server, Windows, Linux or Solaris. **Pro:** Basic positive firewall with simple configuration. **Con:** Stability and installation issues, some false positives.

RATING 3.35

eServer Secure 3.0

Company: Turillion Software, (210) 495-3228, www. turillion.com **Price:** Starting at $995 per server. **Pro:** More coverage beyond basic attacks at inexpensive price. **Con:** Default coverage of attacks incomplete.

RATING 3.1

iSecureWeb Version 1.615

Company: Multinet, (866) 682-9286, www. elitesecureweb.com **Price:** Starting at $2,000. **Pro:** Wealth of configuration options. **Con:** Ease-of-use and stability issues.

The breakdown

	AppShield	InterDo	SecurIIS	webApp.secure	eServerSecure	iSecureWeb
Protection quality 30%	5	5	2.5	3.5	3	3
Configuration 30%	4.5	5	3	3.5	3.5	4
Ease of use 20%	4.5	3.5	5	4.5	3.5	2.5
Installation 10%	4	4	5	2	5	3
Documentation 10%	4.5	4	4	2	2	2
TOTAL SCORE	4.6	4.5	3.55	3.4	3.35	3.1

WORLD CLASS Winner

■ **Scoring Key:** **5:** Exceptional; **4:** Very good; **3:** Average; **2:** Below average; **1:** Consistently subpar

How we did it

We used a pair of Dell PowerEdge 6000 servers running Windows 2000 and Microsoft Internet Information Server 5.0 as the testing platform. The test sites installed used ColdFusion and Active Server Pages for dynamic database access and did not have input sanitization built in. Testing covered exploits such as URL tampering, form-field manipulation, SQL injection and many known IIS server specific exploits. Two other machines on a connected network using automated security audit tools and manual attacks performed testing. A third machine was used as the administration console for altering and configuration where possible. Server interaction was monitored not only at the browser level but the underlying HTTP discussion was monitored to ensure standard interaction between systems.

Web-based management interface.

This is a strictly negative-model firewall, with a respectable blacklist of attack signatures that are blocked by default — long URLs, disallowed methods and directory traversals, for example — and the ability to revise these policies for tighter security. These attacks were blocked as expected.

SQL injection can be combated, but this is addressed through keyword filtering, and you likely will want to strengthen the default policies to make them more robust. This product does not obviously address manipulation of form-field sizes. An update subscription service is offered to keep the attack signatures current. Error pages are fully configurable.

The HTTP management interface is a convenient way to handle remote administrative duties but is also a liability. Security for remote management is provided via basic IP filtering. This is a nice feature, but the wise user most likely will want to employ SSL as well to further secure communication with the firewall.

The Web interface suffers from the statelessness and latency one would expect from HTTP, and some quirks exist — probably a function of the tricky interprocess communication between the ISAPI extension that supports the user interface and the ISAPI filter that is responsible for actually carrying out the security policies.

Changes to the administration interface do not always seem to take effect immediately or consistently, and some of the integrated reporting and statistical features display disconcerting inaccuracies. For example, a single request generated approximately 60 "requests processed," and a number of common attacks were miscategorized.

In general, eServer Secure struck us as a good example of an entry-level product. In that sense, its most direct competitors in this review are iSecureWeb and SecureIIS. Among those products, eServer Secure does not stand out for having any major flaws (apart from its user interface quirks) but neither does it distinguish itself as superior.

WebApp.secure: Positive model on the cheap?

WebScurity's webApp.secure attempts to bring the benefits of positive-model application firewalls within reach of smaller organizations.

Like most positive-model firewalls, webApp.secure bases its security model on a whitelist of permitted requests called Intended Use Guidelines. In webApp.secure's case, this is a list of legal URLs for the entire site, which is built through the use of what webScurity calls "entry points." Entry points let administrators adjust the relative "porousness" of a site/application, by forcing users to come into it through certain pages but not others and also to control URL jumping within the site.

During configuration, entry points that the administrator has designated are treated as starting points for building the map of permitted URLs and navigational paths between them. Essentially, a trusted user (or script) must navigate from each designated entry point to all the pages that are to be treated as legally accessible from that entry point. From this configuration-time traversal, webApp.secure learns where traffic is allowed to enter the site, and where it is allowed to go, establishing positive-model access control. In theory this should be quite useful in combating exploits that depend on URL jumping and other forceful browsing techniques. However, during testing it didn't always work correctly.

WebApp.secure also shines in protecting against form-field manipulation and in blocking the usual run of common attack signatures. SQL injection and cross site scripting are not well defended against by default, but lexical blocking is available by disallowing specific characters in form field values — an example of where the positive model implementation gives way to standard negative model techniques, with a resulting extra burden on the administrator.

Implemented as a proxy that is controlled via an XML configuration file, webApp.secure also provides a native — but somewhat awkward — Windows GUI for administration. When inspecting the configuration or making changes, we often preferred to access the XML configuration file directly.

The product has a number of shortcomings that suggest a lack of overall polish. The error/block pages are hard-coded, making them impossible to edit. Without such modification, the software immediately tells the potential intruder what kind of countermeasure software is installed. However, Version 2.0 of webApp.secure was released after testing and many of these issues might have been addressed.

MultiNet iSecureWeb focuses on Microsoft's IIS

MultiNet's iSecureWeb also is built with ISAPI technology and intended for deployment on IIS hosts. A proxy site (the "Gateway") is set up to filter incoming requests headed to an origin site. Policy administration is done via a stand-alone interface (the "Studio") that can be installed on a separate box. Studio is a two-pane, native Windows affair. Getting used to navigating around its multi-tab, multi-level tree view control — and learning how to make sense of it all — takes a considerable investment of time and patience.

As for the security capabilities of the default rules, common buffer overflow, the default policies handle the illicit character sequence and directory traversal attacks well. However, neither SQL injection nor form-field manipulations are dealt with adequately.

The predominant approach is clearly negative-model, which limits the reach of the default rule set and makes post-installation configuration a must for a secure setup. At that point, considerable power is available to the administrator — especially one willing to wade through the intricacies of the user interface and, in the case of certain rules, deal with the complexities of regular expression syntax. There is probably no Web-based attack that one cannot stop with an iSecureWeb rule, if you've got the patience and knowledge to create and apply it properly.

Error pages are easily located and edited, a good anti-fingerprinting measure. However, it is all for naught because our installation of iSecureWeb doubled the HTTP headers in every response and certain HTTP response codes lacked the usual response message following the numeric code. Not only does such behavior make a host easy to fingerprint, it raises serious doubts about the soundness of MultiNet's proxy implementation in general. Before running iSecureWeb in a production environment, we would want more assurance that it can be set up in a way that makes it fully HTTP-compliant.

Conclusion

The products we tested fall into two distinct classes. The low-end products — SecureIIS, webApp.secure, iSecureWeb, and eServer Secure — are useful but have configuration or occasional operational problems. SecureIIS — while potentially the least capable — is probably the best bet for someone looking for some simple protection for the most basic attacks. However, for those administrators who want to get serious about application-level protection, it is really only a choice between InterDo and App.Shield, with AppShield having a slight advantage in our assessment. However, both have significant learning curves and might require consulting services for correct usage.

In the final analysis there is a lingering question of whether some of the "exploits" these products protect against shouldn't be dealt with during the Web application development process.

Obviously filtering out bad requests is a wise addition to a Web server, but shouldn't a Web application keep track of field sizes and allowed data directly? It would be less expensive and more effective to design security into a Web application in the first place.

Given Sanctum's recently released developer-focused product AppScan DE, it would seem that even Web application firewall vendors understand the need to have security designed into the application from the start. However, the cost of reworking an existing Web application might be significant enough to make even expensive Web application firewalls cost-effective additions to the Web administrator's security arsenal.

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NetworkWorld Review

Taking a Peek into your WLAN

■ BY TOM HENDERSON, NETWORK WORLD GLOBAL TEST ALLIANCE

AIROPEEK NX AND RFGRABBER

Wireless LAN analyzers are rapidly evolving from our last look (see www.nwfusion.com, DocFinder: 7228). They are more compatible with network interface cards, and they are adding value through remote probe devices.

We tested the latest version of WildPacket's notebook-based analyzer, AiroPeek NX, and its passive access point/probe, called RFGrabber. We found a few shortcomings, but overall the combination is a strong one.

Compatibility is key

AiroPeek NX gets praise for having a long list of compatible network cards — the longest list we've seen so far. Standard 802.11b cards are supported, but so are 802.11a, 802.11g and combination cards. Because most organizations purchase combination cards (labeled either 802.a/b/g or 802.a/g cards) in their quest to find rogue access points or peer networks that use 802.11a or 802.11g components, combination card support is important.

AiroPeekNX works best on a Windows 2000 or XP notebook — older versions of Windows are not compatible with WLAN NICs, and no other operating systems are supported for installation.

Part of the philosophy behind AiroPeek NX is that it should be run on a notebook that has a wireline connection because AiroPeek will dominate the WLAN card while it's in use. This means that at least one more NIC of some type is needed to get some of the wildpackets.com HTML Web-based help screens. With only one adapter (being used by the AiroPeek application), you won't get peer network connections or any HTML-based help.

Peeking at packets

We've seen two types of WLAN analyzers: those based on existing analyzers that have been extended for WLAN use; and those built or modified for the unique needs/applications that a WLAN network manager needs to be prepared for.

AiroPeek NX is a hybrid of these analyzers. WildPackets has a strong background in protocol analysis (with its EtherPeek product), and it also added wireless analysis that's better than some products that we tested recently.

The software can be used alone on a notebook or Tablet PC platform — RFGrabber can be combined as an option. You might want to wait until RFGrabber matures, but the fundamentals are sound. RFGrabber is an access point/remote probe that AiroPeek NX sees as if it were a network card resident in the AiroPeek notebook. An RFGrabber driver appears as a probe device to an AiroPeek NX analyzer application, as if it were a locally attached WLAN NIC that would serve as a probe/device for monitoring traffic.

Although AiroPeek NX bears some resemblance to EtherPeek, the additions made for wireless analysis go further than some other protocol analyzer products we've tested. These additional features include extensive filtration for 802.11 packets and a link to an Expert analysis view of captured traffic that is useful and easy to understand.

The Expert mode analyzes conversations and checks for many characteristics of WLAN dysfunction. Like other WLAN analyzers tested, everything it sees is treated as a rogue until it is added to a list of trusted devices. Once a device is trusted, however, AiroPeek still compares various qualities of the devices, unless the devices are purposely filtered out of monitoring or packet capturing.

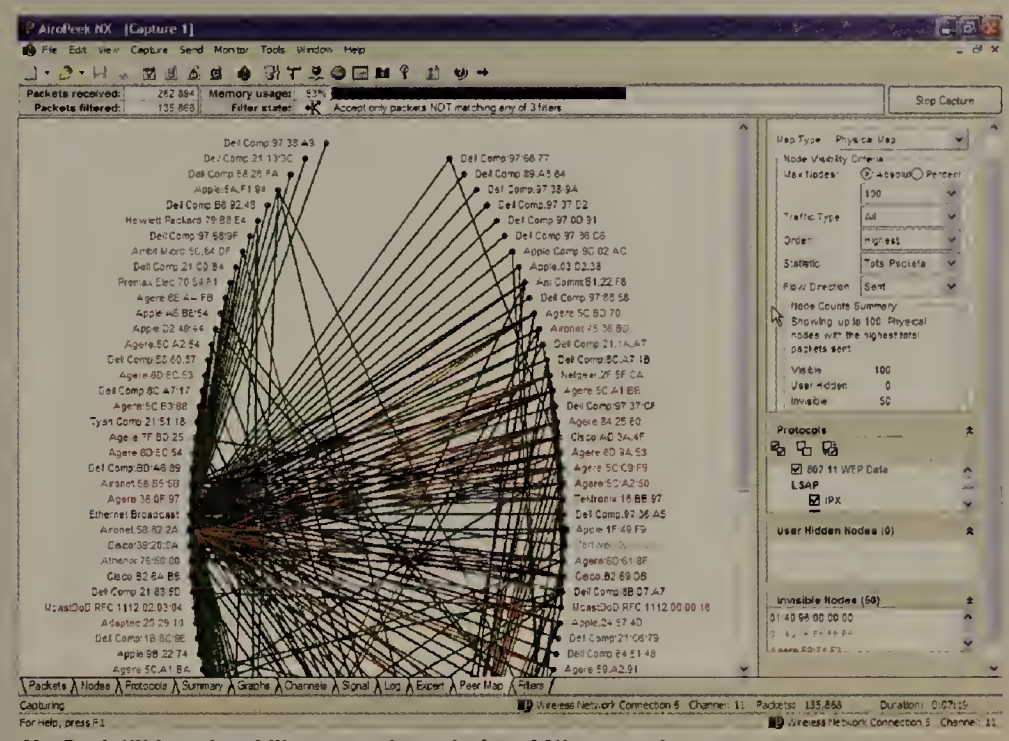
For example, while a device might be in the trusted category, if it suddenly stops using Wired Equivalent Privacy (where WEP is a requirement), the Expert analysis will trip an alarm. The same goes for other conditions, such as a wireless ad hoc connection attempt (making a peer-to-peer connection instead of going to an access point). A wireless client attempting to spoof the IP address of a trusted access point also would trigger an alarm.

When conditions are set via filters and triggers to trip alarms, the alarms can be set so a trail can be made of both the alarm, and what resolved the alarm. Because one type of alarm (such as one indicating the sudden appearance of an untrusted IP address) might not be as important to one organization as it is to another, WildPackets provided two default/example files of alarm types that can be defined for severity levels.

Packet decoding and conversational pairing are two strengths of AiroPeek NX. It was easy to filter and relate user transactions so they could be analyzed from user to resource and back again. WEP packet payload (data) must be decrypted outside the program. WildPackets provides an application that can decrypt the conversations, and is easily scripted to execute with various WEP keys. Packet-decode information also is available about WLAN traffic, such as the usual source/destination and packet-type information that non-encrypted packets have. Filters and triggers are available for many common program problems, such as SQL Server logon failures, and the presence of Yahoo Messenger traffic.

AiroPeek passed all our tests, with the exception of one condition when it couldn't determine that we had two identical 802.11g access points that were set up with identical IP and media access control layer addresses — admittedly, a difficult problem to find. It also cannot probe an access point; it only can look at conversations involving an access point. This means services such as Dynamic Host Configuration Protocol that are provided by an access point (vs. a downstream DHCP server) can't be tested or validated within the context of being a client to the access point, only as a monitor of the access point.

For that reason, a set of tools called Net Tools is provided from the AiroPeek NX distribution CD and is automatically installed, if desired. The tools run outside AiroPeek to perform rudimentary functions often unavailable on Windows, such as pings, traceroutes, DNS lookups and



AiroPeek NX has the ability to monitor wireless LAN connections.

Net Results

AiroPeek NX Version 2.0

OVERALL RATING **4.4**

Company: WildPackets, (800) 466-2447
Cost: $3,500 with 12 months maintenance.
Pros: Strong analysis and monitoring features; strong NIC compatibility. **Cons:** Requires dedicated notebook with wireline connection for most flexible use.

The breakdown	
Ease of use 20%	5
Diagnosis depth 20%	5
Radio features 20%	4
WLAN features 20%	4
Performance 20%	4
TOTAL SCORE	4.4

■ **Scoring Key: 5:** Exceptional; **4:** Very good; **3:** Average; **2:** Below average; **1:** Consistently subpar

RFGrabber 1.0

Company: WildPackets, (800) 466-2447
Cost: $400 for RFGrabber only; $3,700 for AiroPeek NX/RFGrabber bundle. **Pros:** A strong passive-probe device for remote monitoring. **Cons:** Deployment sometimes difficult; currently limited to 802.11b.

port/ping scans. Unfortunately, none can be run concurrently on a single-network card platform, but can run when AiroPeek has two WLAN NICs or a WLAN NIC and an Ethernet interface.

Grabbing RF

RFGrabber looks like an access point, and it's deployed like one, too (it connects to a wired Ethernet port through a device-discovery method). However, it is a passive point, and cannot be found by wireless scanner. RFGrabber passively "listens to the air" to find information within its airspace, and neither sends a radio beacon/signal nor actively responds to one.

Unfortunately, there's no Web interface to reprogram the RFGrabber's IP address or other features — changes must be made by the AiroPeek NX program. We occasionally lost track of the RFGrabber we were using after we made changes. Fortunately, after scanning the pertinent segment, RFGrabber could be found again and re-used for monitoring.

Once installed, the RFGrabber adapter can be selected as the probe (all network cards act as probes to AiroPeek) for monitoring use by AiroPeek. Multiple probes can be monitored up to the available bandwidth of the connections. In our tests, peak sustained output from the probe under streaming-media conditions never surpassed 400K byte/sec.

There are several scenarios suited for the AiroPeek NX/RFGrabber combination, such as branch office deployment for remote monitoring/audit, campus monitoring, and applications where remote WLAN data collection is necessary. We tested the combination in the lab and in a simulated site-to-site IP Security VPN. In both environments, RFGrabber could monitor traffic at the same data rates, and with the same features, as the 802.11b WLAN NICs that we tested with. It also could do this when the connected circuit speed was as fast or faster than IEEE 802.3 10Base-T (10M bit/sec). We did not test RFGrabber at T-1 speeds to see if packets dropped.

There are a few limitations to RFGrabber that weaken its usefulness, but it doesn't diminish our view of AiroPeek NX. First, RFGrabber works only on 802.11b networks, which limits its usefulness until an 802.11 a/b/g or similar version emerges. The reason is that RFGrabber simply can't detect rogue 802.11a or 802.11g traffic. However, it can discern some 802.11b conversations that occur on an 802.11g access point. In pure 802.11g or 802.11a environments, RFGrabber cannot be used for rogue detection or other monitoring.

Bottom line

Many of the strong analysis features of AiroPeek NX weren't overshadowed by its minor operational constraints. And while we like the concept of RFGrabber, its limitation to 802.11b makes it an expensive remote monitor, although an invisible one if and where invisibility to WLAN devices counts. AiroPeek NX has strong WLAN monitoring skills, and hovers above other analyzers that have a strong protocol analyzer background with a grafted WLAN tool kit.

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■ BY BETH SCHULTZ

Before Mike Johnson took a job as network administrator with the Urban Development Department for the city of Tulsa, Okla., he found himself in a job-hunting quandary. He was getting screened out of interview opportunities by hiring interns and headhunters who knew nothing beyond what acronyms to look for in a résumé.

"If my résumé did not have the exact buzzwords and certifications on it and did not fit the job description precisely, they would not have even told anyone about it," Johnson says.

Fortunately for Johnson, Tulsa Urban Development signed him on for an interview even though he lacked the primary skill — Windows NT expertise — required for the job. In detailing project experiences, Johnson convinced the hiring manager that he was the right guy for the job.

"I may not have had any Windows NT experience, but I've been in networking for 20 years and have been a [Certified Novell Engineer] since 1990. I was sure I could figure out Windows NT," he says. "So I told them about projects I had worked on and gave them specific examples."

Johnson's experience of being shut out from job opportunities for lack of specific skills is all too common in the IT profession, hiring experts say. Most technically oriented people over-rely on a job candidate's skills, education and training, says Lou Adler, president of The Adler Group, a training and consulting firm that specializes in recruitment strategies.

Adler tells the hiring managers he's working with to focus on what the person needs to do with the skills, not on skills themselves. "What's the project? What does the person need to be successful on the project?" he says.

Adler based this approach on a technique called the behavioral event interview (BEI). In a BEI, a hiring manager drills down on candidates' true competencies primarily by assessing how they would address hypothetical work challenges and, most importantly, by delving into the experiences job candidates identify as the most career-significant (see sidebar).

A BEI centers on knowing what core competencies — not skills — are essential to a job, explains Linda Pittenger, CEO of People3, a Gartner company specializing in IT human capital management. She defines a competency as a single or set of characteristics that differentiate and predict superior performance in any given job or role.

"If you have 10 programmers and Mary and Johnny are the best by far, we don't care about what the 10 do all day. What we really care about is what Mary and Johnny do that's different than the other eight," Pittenger says. "If they talk to customers more and understand competitors better, then that's what you're looking to hire for."

So if you learn during an interview that one of the toughest challenges a job candidate ever faced was dealing with a delayed application rollout, you would probe for information on how the person handled that situation. "If the last thing they did was talk to the customers, then they don't make it. That's the end of the interview," Pittenger says.

"Instead, most interviewers will ask job candidates how many years of networking they have," he says. "I'd rather have a customer-service person, if that's one of the competencies, and send that person to certification school. You can't teach people those competencies, you can teach them the skills."

Measuring results

Pittenger cites these hiring industry statistics as evidence of the effectiveness of a BEI model: In a typical, unstructured, one-on-one interview, a hiring manager has a 19% chance of making a good match for the job. That likelihood rises to 35% during unstructured team interviews. Using BEI, the chances of getting the hire right jumps to 72%.

Preparing for a behavioral event-based interview isn't necessarily difficult, but it certainly takes more upfront work than does the typical one-on-one method. For one, you'll need to determine job competencies by working with external or internal human resources specialists, buying off-the-shelf models or researching desirable competencies on your own — that is, discovering what competencies make Johnny and Mary superior performers, Pittenger says.

Aquent, a professional services firm in Boston, has used such a performance-based hiring methodology and behavioral event-based interviewing for internal positions. The results have been marked, says Lauren Schellenbach, corporate trainer for the firm.

Hiring managers now create customized performance profiles that detail specific and measurable objectives for the position, and then determine interview questions aimed at uncovering a candidate's ability to meet those job objectives. The goal is to uncover a candidate's big-picture accomplishments and ability to fit within the organization.

Aquent has reduced the number of applicants to a more manageable, qualified pool and has cut the hiring time frame for the position by about 75%, from about four months to three weeks, Schellenbach says. What's more, new hires have exceeded expectations by 15% within their first three months on the job.

This points to another big benefit of using performance- or competency-based methodologies and behavioral-event interviewing — getting candidates invested in the job opportunity. "Candidates appreciate getting to the heart of the matter, and the interview can help get them excited about the job. You can say, 'We're really pushing the envelope on .Net and want the person in this position to take it to the next level. Tell me about the biggest project you've done'," Adler says.

Although the BEI concept has been around since the 1970s, it's just starting to catch on for IT hiring, Pittenger says. When she launched People3 in 1998, only 15% of companies used career-based competencies for IT. Over the years, she has seen that percentage increase to just less than 40%.

"We're making headway," Pittenger says. But still, she wishes for more. She sadly notes, "The most important thing leaders or managers can do is hire the right people, yet that's typically what they spend the least amount of time doing." ■

Components of a behavioral event interview

While some espouse a more streamlined approach, Linda Pittenger, CEO of People3, favors this BEI framework:

Knowledge and credentials: Find out what degrees and certifications job candidates hold, and what they can do.

- How do you prepare an RFP?
- Do you have Microsoft certification?

General experience: Discover responsibilities and temperament.

- What does your typical day entail?
- What do you do when a customer gets angry?

Opinion: Peel the onion back on their motives. Ask questions related to your company's culture .

- What are your strengths and weaknesses?
- Why did you apply for this job?

Hypothetical: Unveil how job candidates address a situation. Answers will tell whether a person will work independently, seek assistance or be customer-focused.

- What would you do if your servers went down?
- How would you escalate the issue?

Behavioral-event critical incidents: Provide the opportunity for job candidates to show challenges, actions and results. Ask five or six open-ended questions about the most important situations candidates have experienced in their current roles, and two or three questions on their failures and successes.

- What was the situation and the event leading up to it?
- What was your role?
- How did you feel?
- What did you want to do about the situation, and what did you do?
- What was the final outcome?
- What did you learn?

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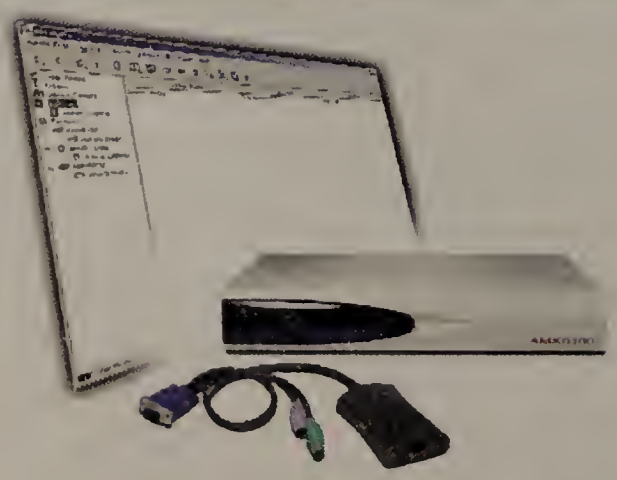

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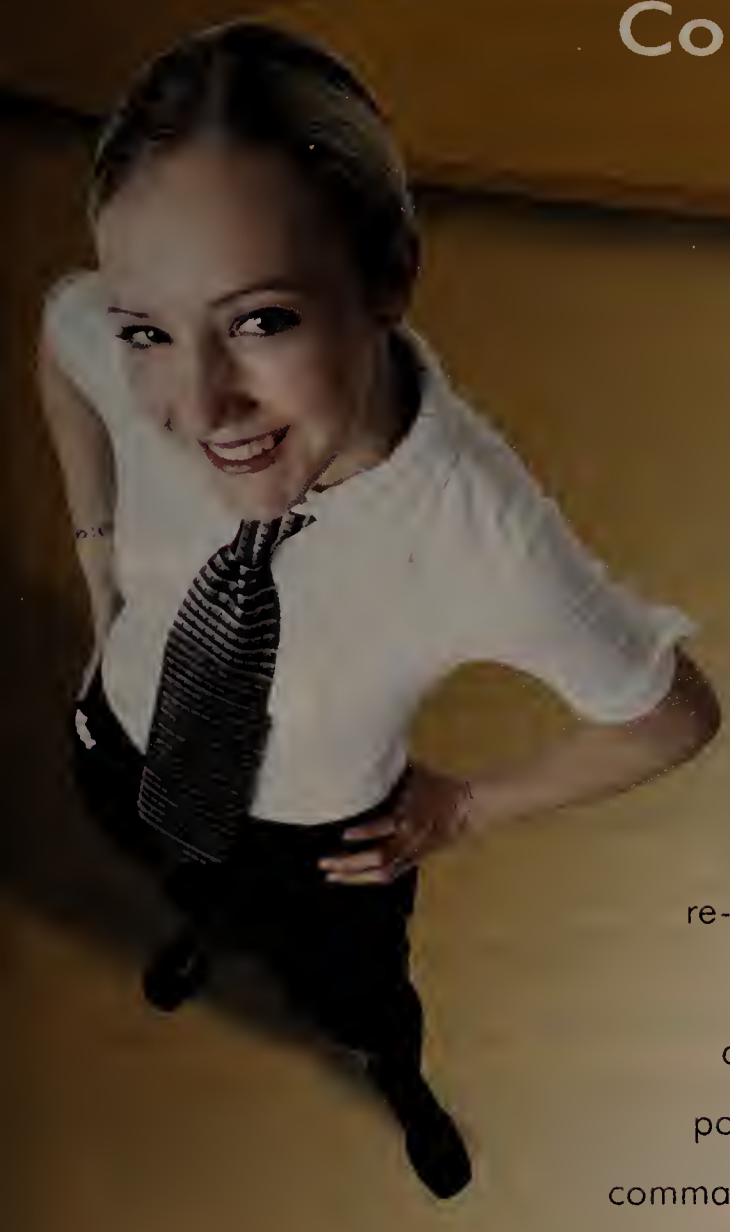

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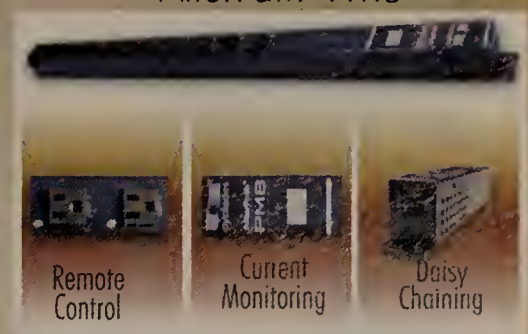

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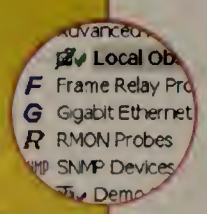

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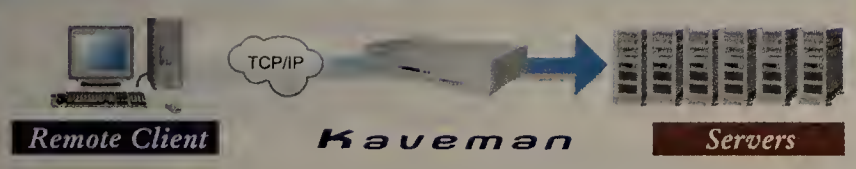

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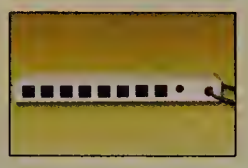

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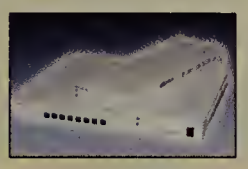

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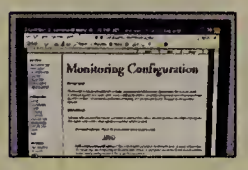

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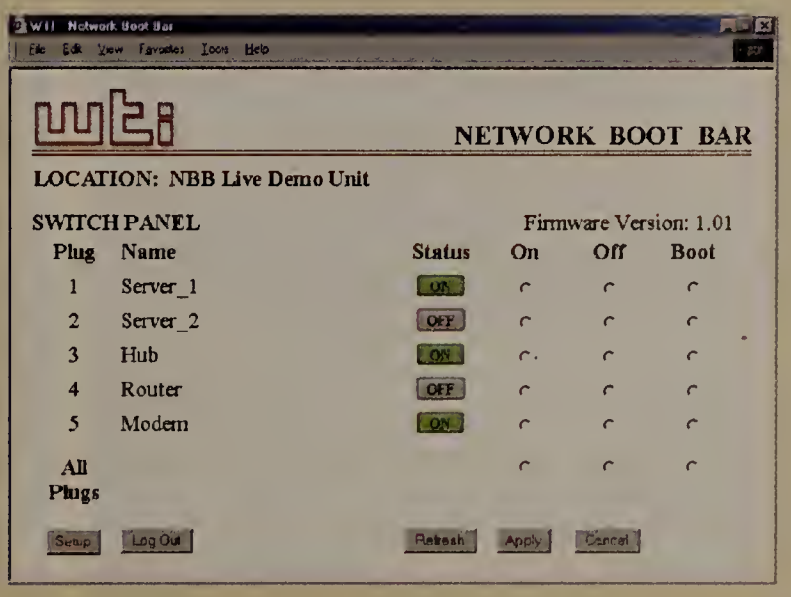

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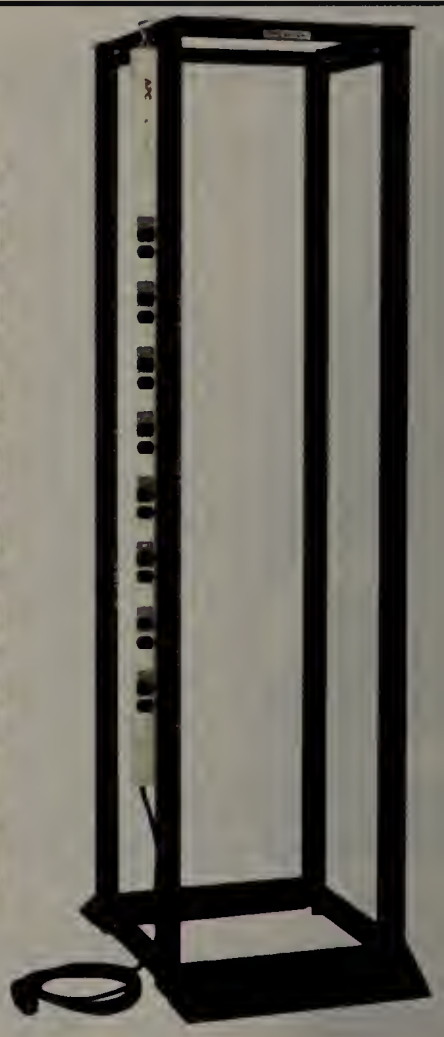

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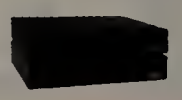

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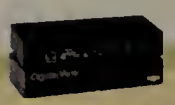

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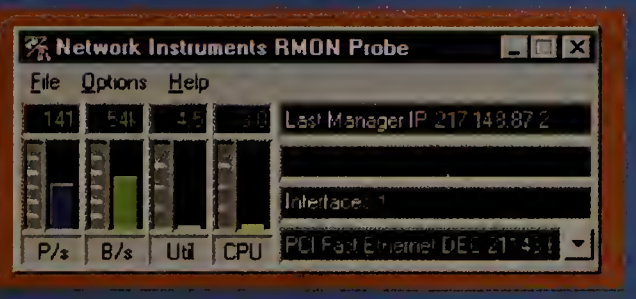

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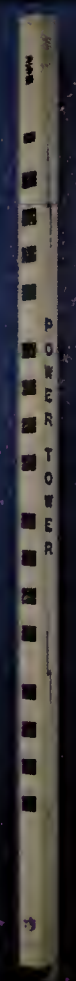

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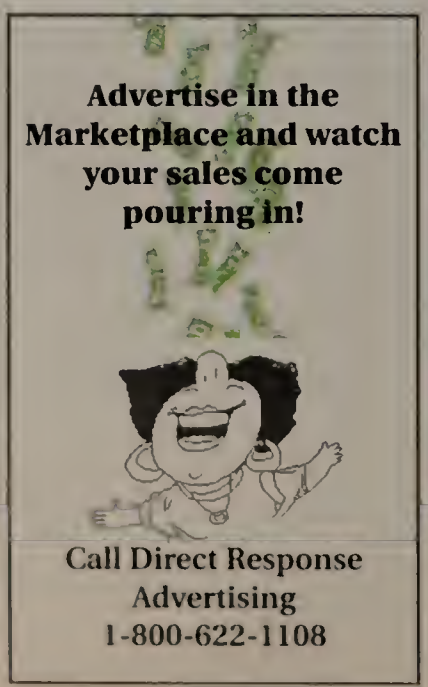
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Programmer Analysts Greenwich Village Fish Co. Inc. has openings for Programmer Analysts for locs in NY. Analyze, dsgn. dvlp, test & implmt s/ware & web based applics using MS Access, MS SOL, ASP, XML, HTML/DHTML, C++, VB Script, Jscript, Netscape Composer, Tango Creator, & Visual InterDev. Pos req Bach in Elec. & Comp Eng or Comp Sci w/2 yrs exp. Must have legal authority to work in US. Excellent pay & benefits. Email resume w/proof of work status to: apply@citarella.com

Software Engineer. Research, design, develop, install microprocessor-based soil-testing unit software systems, including funct specs, high-level design, prototype prep., board design & layout. Analyze software reqs Hardware prod. dev. Pacal, C++, Assembler prog Module & unit testing. Reqs: Master's or foreign equiv. in Mngmnt Info. Systems or Comp. Sci. & 4 yrs exp. as Software Eng., Comp. Prog., or Software Dev Exp. which may have been obtained concurrently must include 4 yrs exp. in C++, Pascal, Assembler EOE. 40 hrs/wk Send resume to Sasha Kron, Kron Management Consulting, Inc., 1120 Coronation Drive, Dunwoody, GA 30338.

Unix Systems Analyst: SunManagement Center, BMC Patrol on a Sun/Solaris platform. Experience with Application readiness service. Please send resumes to ahilenski @sigconsult.com.

IT Positions - Oracle, VB/ASP Access, C/C++, Visual C++, Cobol, J2EE Framework, Java Script, HTML, DB2, Unix, Web Interface, IMS, CICS, IBM mainframe, TeamCenter Enterprise, Matlab. Send resume to EASi Engineering, 1551 E. Lincoln Ave., Madison Heights, MI 48071, or email to Recruiter@easiusa.com. Must include Ref #:SP0803IT. No calls. EOE.

Amtex provides high-quality end-to-end software solutions. We need IT professionals work on SADI, WC, and EDB system with Rational Rose, JAVA with STRUTS framework, Data Access Objects to access Stored Procedures written in COBOL. Contact: info@amtexsystems.com. EOE

Picobyte Consulting is looking for programmer/system analysts, software/project engineers. We require BS/MS with at least 1-year experience in the IT field. Strong skills in EJB, Oracle, VB, SAP, Java, SQL preferred. Send resumes to 1500 S. 6th St. Ste. B, Springfield, IL 62703. EOE.

AppleSoft, Inc., seeks qualified software developers and analysts for projects in Taylorsville, Utah & other locations in the US: B.S. + 2 yrs exp. Send resume to HR, 721 W. Sunny River Rd., #428, Taylorsville, UT 84123.

PROGRAMMER ANALYST - Analyze, design, program, implement, support advanced computer applications utilizing Java-based CORBA, Swing, Java, Java Script, XML, HTML, Weblogic application server under UNIX and/or Windows operating environment for client/server and/or internet-related applications. Responsible for migration issues converting from BOA-based CORBA to POA-based CORBA & integration of enterprise systems & legacy systems. Req. Bachelors in Comp. Sci., MIS, or Engg (any field) plus 2 yrs exp. Contact: International Systems Technologies, Inc., 1812 Front Street, Scotch Plains, NJ 07076.

Corpus has multiple openings for IT professionals. Following skills preferred: Oracle, SOL, PL/SQL, COBOL, C/C++, VB, SAP, Java, XML, ERP, ASP, NT, XSL. Minimum BS degree. Traveling is required for some positions. Please send resumes to info@corpusInc.com. EOE.

Aluminum Blanking has openings for system or programmer analyst responsible for Oracle database administration & Intranet management. Candidates must have BS with exp. in Oracle DBA. We offer competitive wage with full benefits. Please contact: landerson@albl.com. EOE

Snake Eye Inc. (Houston, TX) is seeking Database Administrator. 6 mon. exp. using Visual InterDev 6.0, Frontpage, Photoshop 6.0, and Oracle. Send resume to 9300C Harwin Dr., Houston, TX 77036 or 713-278-9588(F). Attn: Mike.
Southern Chinese Newspaper Publishing Co. (Houston, TX) is seeking computer programmer. 6 mon. exp. using Chinese Windows. Send resume to 11122 Bellaire Blvd, Houston, TX 77072 or 281-498-2728(F)/281-498-4310(T). Attn: Jean Lin.

Programmer Analyst: Analyze, dsgn, dvlp, implmt, test, document & maintain s/ware applics using MTS, DTS, COM/DCOM, XML/ XSLT, Business Objects, Crystal Reports ASP, Java, VBScript, RDS, IIS Administration, Erwin, C, C++ & InstallShield. Bach in Engg or its foreign academic equiv + 2yrs exp in job offd. Res: Office Mgr, Artilligence, 4142 Ogletown-Stanton Rd, #230, Newark, DE 19713. Fax: 603-372-2771.

Transportation co. in Chicago, IL involved in tank container leasing looking for Sr. IT Manager for Tank Div. Qualified candidate will manage functional technical/ business operations of IT Div. Manage/ implementation of new/enhanced O.O. Client Server applic. used for co.'s tracking/billing systems. Adm. specialized systems applic. throughout regional offices. Supv./train professionals in IT projects. Prev. exp. must include technical analysis, design, development & supervision of IS conversion projects as applied to tank leasing or transportation industry combined w/operational mngmt. exp. Computer tools/ skills required-exp. w/any 3 of the following: Legacy, Forte, Crystal, Oracle, NT Server, People Soft plus at least 6 months experience with Java, SQL Server, Business Objects & Great Plains. Bachelors (U.S., foreign or equiv. training, edu. & exp.) in Bus. Adm., MIS or Comp. Sci. w/3 yrs exp. in job offered or as a Project Manager, Business Support Analyst or System Analyst. Send Resumes via email to Union Tank Car Company at recruit@marmon.com. No calls please.

Systems Analyst wanted by MLCO. Manage day-to-day operation of e-commerce application sys.; coordinate with project managers to develop strategic enhancements and translate custom business rules into feasible technical solutions; responsible for design, development, testing and deployment of all enhancements to multi-tier e-commerce application & design and implementation of custom integration solutions with business partners; upgrade application level security; collaborate with technical team to integrate application with existing functionality of legacy sys. Requires a BS in Comp. Sci. & 2 yrs exp. in application development & e-commerce consulting & database admin. & expertise in BEA WebLogic Server 8.1 & J2EE Application development & Microsoft SOLServer 2000. Respond to: Mike Kunz, Michael Lewis Co, 201 Mittel Drive, Wood Dale, IL 60191.

Assistant Network Administrator Administer Novell Netware, Macintosh Apple Share IP Server, Email Server, Microsoft SOL Server, Microsoft IIS & Java 2 Enterprise Ed. Server. Program web appli. in ASP, JSP, & Java. Database design & analysis in Microsoft SQL Server, Visual dBase, mySQL, & Microsoft Access. B.S. in CS or rel. & abil. to use C++, HTML, Java, ASP, JSP, mySOL, CFML, UNIX, Linux, VB, Scheme, ColdFusion Studio. 40hr/wk. 9-5. Send resume to: Ms. Cindra Tan, VP Finance, Bennett Kuhn Varner, Inc., 2964 Peachtree Road, Ste. 700, Atlanta, GA 30305

Portal Content Analyst - Responsible for analyzing, evaluating and developing content for Spanish portal (website) of BellSouth.net. Master's degree in Computer Science, Computer Information Systems or related field required and one year experience in systems and web content analysis OR Bachelor's degree in stated fields and three years' of stated experience. Must be fluent in Spanish. Please forward resume to Attn: Lisa Burlingame, BellSouth, 2247 Northlake Parkway, Suite 800, Tucker, Georgia 30084. Please do not email or fax resumes. EOE.

SENIOR PROGRAMMER ANALYST: (Retirement Products & Services) Participate in projects leading to the analysis, design, enhancement and modification of financial, business and management systems, applications and programs. Respons. include: analyzing pertinent data, information and modes of operation; evaluating existing and proposed systems; translating comprehensive business requirements into detailed functional specifications. Duties incl.: develop and test systems solutions; write, test and debug progams; provide support in the implementation process; define systems parameters; prepare SW/end-user documentation; provide training, troubleshooting and technical support services; install and maintain mainframe systems; and complete application development for financial services products. Daily use of Cobol II, PL-SOL, JCL, CICS, VSAM and TSO/ISPF. Min. Reqt's; BS/BA (foreign equivalent accepted) in CS, EE or related field of study plus 2 years exp. in job offered or 2 years exp. in related occupation (i.e. Programming or Systems Analysis). MUST possess demonstrated expertise in the following: (1) Major system installation including development, implementation, and maintenance of mainframe systems; (2) Applications development for financial services products and industry, including financial reporting; and (3) Programming and analysis using multiple mainframe tools and utilities including; Cobol II, PL-SOL, JCL, CICS, VSAM and TSO/ISPF. Basic salary pay range is $55,500-65,000 per year FT and standard company benefits. EEO. Submit 2 resumes and respond to Case No. 2002-02298, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114.

Senior Software Engineer, working as a senior-level individual contributor in various projects, will design, code, test and deliver sophisticated web-based n-tier client/server J2EE applications utilizing Java Servlets, EJBs and JSPs for the Company's multiple channel platform catering to wireless devices, interactive television and conventional browsers. Will be responsible for assessing specific user requirements, and then defining system and application specifications to meet end-user needs. Will participate at senior level in each phase of project life cycle development, and will integrate web-based applications and systems from the concept phase through post-implementation performance monitoring, Will perform object-oriented analysis and software design. Will coordinate with release engineering, quality assurance and internet security departments to ensure successful implementation in pre and post production stages. Requires Bachelor's or equivalent in Computer Science, Engineering, Mathematics, or Physics and three (3) years in job offered OR three (3) years experience in web-based client/server development. Candidate must also possess demonstrated expertise in object oriented design and analysis; demonstrated expertise developing n-tier J2EE web-based applications using Java Servlets, EJBs and JSPs; and demonstrated expertise parsing, validating and transforming XML data using XSL transformation. Salary: $79,900/yr, M-F. 9AM-5PM. Send 2 resumes to Case #200202693, Labor Exchange Office, 19 Staniford St., 1st fl., Boston, MA 02114 EOE. Applicants must be U.S. workers ellgible to accept full-time employment in U.S.

SENIOR PROGRAMMER ANALYST: (Ancillary IS Support Dept.) Formulate and define systems scope and objectives in order to purchase, design, develop or modify information systems. Respons. & duties incl: ID and analysis of business requirements geared towards applying computer technology to business processes; creating functional specifications and programming to these specifications where no suitable vendor solution has been identified to solve business problem; vendor application software research and valuation, installation and customization of vendor packages as required by business community; system integration as required by business functionality; creating functional specifications and programming conversion and interface processes; analysis, preparation of documentation and presentation to the Technology Planning committee on SW application systems requested to be developed/purchased by the business community; act as a liaison between business personnel in the ancillary departments and outside vendors. Central IS or other business units' IS communities on any IT-related issues; and provide administrative functionality, training and application support for vendor packages, where appropriate. Min. Reqt's: BS/BA (foreign equivalent accepted) in CS, EE or related field of study plus 2 years exp. in job offered or 2 years exp. in related occupation (i.e. Programming or Systems Analysis). MUST possess demonstrated expertise in the following: (1) Major system installation including development, implementation, and maintenance of distributed systems; (2) Programming and Database develop. with: VB/C, Powerbuilder, MS SQL Server and Access databases; (3) Applications development for financial services products and industry including financial reporting; and (4) Using Crystal Reports, PVCS Dimensions, HTML and UNIX. Basic pay range is $55,500 to 65,000 per year FT and standard company benefits. EEO. Submit 2 resumes and respond to Case No 2002-02290, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114

Engineer, Video Software. Must have min. 4yr exp in computer-based video prodctn & editing, w/technical knowl of lineal & non-lineal Media 100 Systms & Fiber Channel N/work Integrator S/ware. Fax res: WNV Sales, 305-358-3116, Attn: Ms. Guttierez.

Systems Analyst (2 Position) Design, analysis and development of web and other applications with the focus on E-commerce solutions using VB, Oracle and connectivity with MS SQL database. Req. BS/BBA with 2 yrs of exp. Resume to Ambason Inc., 681 Troy Schenectady Road, Latham, NY 12110.

ND based IT company has openings for Software Engineers & DBA's. (Multiple openings): Research, Analyze, Design, develop, test, diagnose, and implement various business applications

Real time OS Vx Works, Networking Protocols, PeopleSoft HR/Financials, IPSEC, IKE, BAAN ERP, BAAN tools, SAP r/3 and ABAP/4, Oracle 8.x/9.x/11.x, Sun Solaris 2.8, Veritas Clustering, Oracle Utilities, Unix Shell Scripting, PL/SQL, Erwin Data Modeling/ Designing, Web Technologies like J2EE, JDBC/ODBC, Web sphere, EJB, COM/DCOM, C/C++, MS SOL Server, UNIX, J2EE Architect/Team-Lead experience in implementing financial applications on HP-Tandem Non-stop systems Product Administration System SABLIME. Business Objects 5.1.5, Data Warehousing, Informatica - Power Center 5.1, SAS 8, Teradata Utilities, Erwin, Power Mart5.1 / PowerCenter 5, Data Junction, Cognos Impromptu 7.0, JD Edwards, WinRunner 6.0, Test Director 6.0, Silk, Load Runner, Rational Suite, SOA Suite.

DBAs must have experience in installation, migration, moving, setup, monitoring and trouble shooting of various database applications. May require travel to client sites. Software Engineer $$78,000 & up; DBA:$60,000 and up. Mail resume to 212, South 4th Street, Suite# 202, Grand Forks, ND 58201

Lead SW Dev Eng (Denver, CO) - Lead in the team effort to design/develop computer SW programs using SW programming languages & tools incl. C/C++ on UNIX & sybase open server/open client libraries implemented in multiple platforms w/multiple application interfaces. Design/develop GUI for user interaction. Perform data communication programming using TCP/IP, MO Series & Remote Procedural Calls (RPC) for interprocess communication & communicating w/different telecom switches (Network Elements). Design/develop user database in Sybase. Work w/ modeling & architecture groups to explore system design tradeoffs & to develop optimization procedures for improving network provisioning efficiency & reducing total costs. MS Comp Sci/Eng/related + working/theoretical knowledge of. Commercial grade SW development in UNIX environment using C/C++ & sybase open server/ open client libranes; Data communication programming using TCP/IP, MO Series & RPC; Sybase database application programming using stored procedures; Basic knowledge of Telecom switch (Network element) interfaces. $81,900/yr, M-F 8-5. Resume only to Workforce Development Programs, PO Box 46547, Denver, CO 80202. Ref. Job#CO5053475.

SYSTEMS ANALYST

Analyzes user requirements, procedures and problems to automate processing or to improve existing computer systems Bachelor's degree in computer science, engineering or math-related and 2 yrs. experience in Visual Basic, ASP, Microsoft Plumtree Corporate Portal 3.5, Web objects 3.0. Must be able to travel. Apply by resume only to Murali K Suddala, Capncorn Systems Inc 3569 Habersham-at - Northlake Building K Tucker GA 30084

Senior Software Engineer to design & implement reliable, scalable server that supports the Internet-wide deployment of peer-to-peer clients. Utilize Object Oriented programming and an expert knowledge of C++ in Windows and Unix. Min. req's: M.S. in Comp. Sci. or rel.field; and1 yr. experience in the job offered or in a related position working with Windows & Unix systems & network development in C++. Special req's: ability to understand & communicate complex technical topics; experience w/design & implementation of network protocols, operating systems, distributed algorithms & compilers. Must have unrestricted authorization to work in U.S. M-F, 9 am - 5 pm, 40 hrs/wk. Salary: $81,235. An EOE. Send 2 copies of resume to Case No. 200202100, Labor Exchange Office, 19 Staniford St., 1st FL., Boston, MA 02114.

Application Developer. NY, NY. BS in Comp. Sci. w/1 yr exp in job or as Applicat'n Pgmr Anlyst. Dsgn, dvlop, & deploy large-scale r/time web based applicat'n using PERL, RDBMS, FASTCGI, JAVA on SOLARIS platfrm. Share & syndicate mkt dta using XML based dta exchange tech as SOAP & WDDI. Re-dsgn & modify WSS C/C++ server applicat'n & JAVA applet client applicat'n w/adv TCP/IP socket progmng. Support & maintain dta feed using TFN Firstcall, COMTEX & DowJones. Prfm optimizt'n & dta mining using ETL & SQL. Dvlop & provide solut'n to investor using IT tech & finncial mkt info, such as institutional holding, portfolio mgmt, SEC/EDGAR filing, insider transact'n. Send resume to Mr. Chun, Wall Street Source, LLC, 120 Broadway, 27th Fl., NY, NY 10011.

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Senior Software Automation Quality Consultant - Responsible for developing applying and maintaining quality standards for software applications. Develop and execute Automated software test plans extensively utilizing Mercury Interactive WinRunner, LoadRunner, TestDirector Analyze software statically and dynamically using McCabe Extensive Global Distribution System knowledge is required. Masters Degree in Computer Science or relevant field with 4 years of work experience in related occupation. 40 Hrs./week . $70,000/annum. Must be willing to relocate to various unanticipated work locations throughout the USA every 4 to 10 months, employer paid. Must have proof of legal authority to work in the United States. Send your resumes to the Iowa Workforce Center, 215 Watson Powell Jr Way, #100, Des Moines, Iowa 50309-1727 Please refer to Job Order IA1101776 Employer paid advertisement.

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Market Research Analyst

Research market conditions for computer sales and consultancy firm. Determine potential sales of products and services. Gather information on marketing methods and distribution, price and sales. Liaison with foreign government officials in Nigeria and Sierra Leone to obtain information. 40 hrs/wk, no OT., 11 months experience in above. Send resume to Quest Corporation, 512 East Jefferson St., Fort Wayne, In 46802. No Phone Calls.

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Database Developer, Specialized Libraries: Design/manage marketing/market-research data gathering/storage libraries. Perform data manipulation to project market senerios using knowledge of market research methodologies. Provide data extraction, loading, structuring for specialized business data libraries. 8:30a-5:30p. Req: Bach Bus Admin in Economics/ Finance & 1 yr exp or as Tech MIS Coord &/or Web Developer. Resume: J. Stulb, Morris Communications, 699 Broad St, #800, Augusta, GA 30901

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Oracle Applications Developer: Design & develop Oracle Databases & Graphical user interface. Develop user interface using multiple web technologies for generating reports; Oracle Forms 6i, Reports 6i, PL/SQL, SQL Reports, Java Script 1.1, HTML, Pro C, Java and J2EE. Please send resumes to 101 Southhall Lane, Suite 220, Maitland, FL 32751.

Advansoft (Soft O Soft) is looking for program or system analysts, IT engineers. Candidate must have BS or equivalent. Exp. in IT area such as Oracle, Java, VB, WebSphere/Weblogic etc is plus. Travel maybe required for some position. Send resumes to: info@advansoft.com. EOE

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Programmer Analyst. Convert customer requirements into program specifications; analyze impact of proposed solutions on business applications; ensure satisfactory functioning through testing and analysis of results; correct deficiencies according to customer requirements; and review work of development team members. Must have 3 yrs. exp. as Programmer Analyst or Programmer, including 3 yrs. exp. with Object Oriented programming, SOL, Oracle, UNIX, Windows application development; programming in C; and JavaScript . Send resume to APAC Customer Services, Inc., Attn: Cindy Corkery, 6 Parkway North Center, Deerfield, IL 60015. EOE/AA

APAC CUSTOMER SERVICES, INC. is not affiliated with APAC, Inc., the road paving and construction materials company.

Webmaster. Responsibilities include web design & development; E-Commerce system maintenance using web templates, web ordering system and web catalog; web marketing; and web server maintenance. Must have Bachelor's in Computer Science, MIS or related, and must have knowledge of E-Commerce including digital payment, online catalogs, data exchange and security; search engine optimization; ASP; Dreamweaver; Photoshop; and MS IIS Web Server. Send resume to Overland Sheepskin Company. Inc., Attn: HR Dept., 2096 Nutmeg Ave., Fairfield, IA 52556.

Quality Assurance Analyst. Develop & execute test plans & test cases. Conduct black box, white box, regression, usability, load, performance, & stress testing using SQL Server, TestPartner, Rational Robot, JMeter and InCtrl5 for automated testing & Bugzilla for defect tracking. Must have Bachelor's in Comp Sci, Bus, Info Sys or related + 6 mos exp as QA Analyst or Prog Analyst, incl 6 mos exp testing web-based applications. Must have exp writing test plans & test cases, black box, white box, usability, load, & performance testing, knowl of SQL Server & automated testing tools. Send cover ltr, resume & salary req. to: Fiserv AIS. Attn: HR, 4200 University Ave. Suite 400, West Des Moines, IA 50266. Fiserv Advanced Insurance Solutions is an Equal Opportunity/ Affirmative Action Employer.

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Editorial Index

A
Active Endpoints 18
Airgo Networks 12
AOL Time Warner 1, 6
Aspelle 6
AT&T 1, 6, 19

B
BMC Software 21

C
Cablevision 1
Cisco 1, 19, 21
Comcast 1
Cox Communications 1

E
eEye Digital Security 48
Equant 23
Extreme Networks 1
Extreme Networks 46

F
Fiberlink Communications 25

H
HP 1, 19, 45
Hughes Network Systems 43

K
KaVaDo 48
Keynote 21

L
Lotus 43

M
Maxxan 19
MCI 6, 19, 66
Microsoft 1
MultiNet 48

N
NEC-Mitsubishi 45
Neoteris 25
New Edge Networks 23
Nextel 6, 23

P
Polycom 21
Procom Technology 43

Q
Qwest 1

R
Raritan Computer 19
Research in Motion 43, 45

S
Sanctum 48
Savvis Communications 23
SBC 1
SCO Group 6
Smarthome 43
SMC Networks 19
Sonic Mobility 18
Sorrento Networks 23
Sprint PCS 6, 23

T
T-Mobile 45
Turillion Software 48

V
Verizon 1, 6, 19

W
webScurity 48
WildPackets 51

Advertiser Index

Advertiser	Page #	URL
Adtran	11	www.adtran.com
AmericanPowerConversion	16,17,56,58	www.apc.com
AvocentCorp	54	www.avocent.com/advantage
CovadCommunications	26	www.covad.com/t1challenge
CycladesCorp	55	www.cyclades.com/nw
DellComputerCorp	14-15,24,25	www.dell.com/san4
DigitalV6Corp	57	www.digitalv6.com
dtSearchCorp	59	www.dtsearch.com
FoundryNetworks	4	www.foundrynetworks.com/fes
IBMCorp	65	ibm.com/websphere/seeit
IBMCorp	67	www.ibm.com/db2/integrate
IBMCorp	2-3	ibm.com/eserver/ondemand
NetworkInstrumentsLLC	56,59	www.networkinstruments.com
RoseElectronics	58	www.rose.com
ServerTechnology	59	www.servertech.com
SharpElectronicsCorp	8-9	sharpusa.com
SunMicrosystemsInc	68	www.sun.com/lowcost
VeritasSoftware	7	veritas.com
WesternTelematic	57	www.wti.com

10GigabitEthernetEditorialSupplement

3COMCorp	11	www.3com.com/gigabit/2hotspot
CanonUSAInc	7	canobeam.com
EnterasysNetworks	15	enterasys.com/nw/n-series
ExtremeNetworks	2-3	extremenetworks.com/go/bd.htm
FoundryNetworks	16	www.foundrynetworks.com/10GbE
HewlettPackard	8-9	www.itworld.com/it/webcast/procurve
MRVCommunicationsInc	4	mrv.com/nwdm

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BackSpin Mark Gibbs

Readers respond on MCI and ethics

"I hope we shall . . . crush in its birth the aristocracy of our moneyed corporations, which dare already to challenge our government to a trial of strength and bid defiance to the laws of our country."

— Thomas Jefferson, 1816 (thanks to reader Greg Holman)

I was going to pick up where I left off on the topic of what to do about spam, but after last week's Backspin on MCI's shenanigans I need to address the flood of e-mail.

First, a few MCI folks wrote to profess innocence. Here's a typical example: "Gee, thanks for lumping me in there with Bernie Ebbers. You will never know (if you are lucky) just how much you annoyed thousands of honest MCI employees or just how much you managed to help the vultures in AT&T [who] are running this latest smear campaign."

Sir, I wasn't talking about you personally. Honest. But it does appear that corruption is rampant within MCI at many levels.

What intrigued me was the number of people who wrote in confirming my suspicions.

"It is one of the worst-kept secrets in the telecom/Internet industry that MCI has been an unethical place to work," one reader says. "Some people who worked there prior to WorldCom had good feelings when they walked away, but the situation was deteriorating even then.

"It was never a question of whether the company was corrupt — it was a question of when the world would find out," he adds. "In this case, journalists and prosecutors were definitely the last to know; not that some of us didn't try to tell journalists. Those of us in the industry were amazed that nobody figured it out.

"An additional issue — not discussed much — is that there is this huge body of MCI alums who have gone on to work in other places and taken the culture with them," he continues. "It's corrupted many companies where former MCI/WorldCom types have become top executives. I did work at one of those companies — and it was like the Wild West. Anything went. The company eventually collapsed, and those MCI folks have gone on to take the disease with them elsewhere."

Another reader commented:

"I have been fuming about MCI since they began, all for naught. I started my career at Illinois Bell and the exchange where MCI first linked into Chicago from St. Louis was part of my operations responsibility . . . . While the techs doing the job in both companies got along fine, any contact above that level always had a lawsuit threat as part of the conversation. . . . My last assignment with Bell was at [an] interexchange carrier department. MCI got so obnoxious that they would have their courier bringing us a check [to avoid service interruption for nonpayment, and] wait in the parking lot until 4:59 p.m. on Friday of the deadline week, just to ensure 'last minute' payment."

Another wave of commentary concerned the bigger issue of corporate ethics and how they affect IT people. It seems many of you are concerned about the way large companies can create an environment that encourages duplicity and dishonesty.

"Integrity seems to have taken a back seat to profit, [as] is evident not only [from] your examples but [also] from my reading and personal experiences," one reader says. "I have turned away IT business where I thought the method was unethical, only to be looked at with disbelief.

"In any event, in large companies IT professionals are strong-armed into situations where they enable the dishonesty to exist," he continues. "From an IT perspective I know there is no way for me or others not to know what is going on."

And that is the crux of the matter. IT people usually do know what is going on in their companies. Whether they can change what happens is another matter. Having an ethical position is the first step.

Express your position to backspin@gibbs.com.

'NetBuzz News, insights, opinions and oddities

By Paul McNamara

'Dear Mr. President . . .'

Buzz recently sent an e-mail to President Bush. Here's an excerpt from the reply:

"Because of the large volume of e-mail received, the president cannot personally respond to each message. However, the White House staff considers and reports citizen ideas and concerns."

The first sentence is amusing in that someone at the White House apparently believes that in this global society of ours there lives an individual who possesses sufficient intellectual wherewithal to send an e-mail but not enough to understand that the leader of the free world cannot answer all of his.

The second sentence reads as though it were written by a certain former president known for his semantic slipperiness. It suggests that e-mail sent to this address will be read by White House staff and perhaps passed along to the president . . . although it actually says no such thing.

Grown-ups know, of course, that John Hinckley has a better chance of reaching the Oval Office than does an e-mail sent to president@whitehouse.gov. Yet the White House, much like large corporations and image-conscious celebrities, perceives a need to maintain the fiction of an always-open two-way communications channel called e-mail.

In the olden days, citizens wrote to the president using pen, paper, perhaps a typewriter and the occasional crayon. President Bush Version 1.0 was actually famous for scratching out countless longhand notes.

One reason his son can't personally answer all of today's presidential e-mail is that president@whitehouse.gov reportedly receives 15,000 messages every day. They are not all from concerned citizens. A healthy chunk is spam, both the garden variety endured by all of us and its close cousin: politically orchestrated, often-automated, mass e-mailings that are roughly equivalent to a cacophony of honking horns in a traffic jam. We're talking about a bunch of noise that is pretty darn useless for any purpose other than creating the impression of openness.

To its credit, the White House has launched an alternative — White House Web Mail — that it says is designed to do a bit better by weeding out the political spam. Whether that's really the motive is being questioned by some.

The Web Mail form — www.whitehouse.gov/webmail — won't win any design prizes . . . or friends. The thing has far too many required fields, each of which constitutes a potential barrier for the sender, in particular one unfamiliar with such forms. For example, the site originally rejected my submission because I had failed to select "Mr." from a drop-down menu of courtesy titles preceding my name.

Users are not only asked to declare the topic of their correspondence from a limited variety of choices, but also to state upfront whether their comments will support or oppose the president's position on whatever that topic may be. One need not be a cynical journalist to wonder if the categorization has any bearing on the likelihood of getting a reply.

All in all, the form seeks far more personal information than required to simply ascertain whether the sender is a human being and not an automatic e-mail-generating program.

So here's what I wrote to the president using the new system:

"Dear President Bush: While I understand the need to filter out all the junk that tries to pass as legitimate e-mail to your office, this new system is far too complex and cumbersome. You'd do well to order a simplification before anyone starts to think you don't really want to hear from us."

Haven't gotten a reply.

Mark me gone for two weeks of vacation, during which time this space will be filled by the always-entertaining observations of Network World Fusion Executive Editor Adam Gaffin. You can still write to me, though, without filling out any forms. The address is buzz@nww.com.

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